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ABSTRACT

Out-of-wedlock birth rates have not fallen much at all among teenagers. New analyses of existing data sets indicate that becoming an out-of-wedlock parent is a process with three stages: commencement of sexual activity; conception among the sexually active; and pregnancy outcome among those who conceive. Public policy variables such as AFDC benefits, family planning services and abortion availability did not increase the likelihood of sexual intercourse. Teenagers were found likely to make the transition as they become older, if their fathers were poorly educated; if (among non-blacks) they lived on the Pacific Coast; if they were black; and if they were from a more recent birth cohort or a non-intact family. The examination of data regarding pregnancy among the group who were sexually experienced indicated that AFDC benefits did not serve as an economic incentive to childbearing outside of marriage. On the other hand, the impact of liberal family planning and abortion policies is cited in reducing the incidence of out-of-wedlock childbearing. (BN)

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September 1976

OUT-OF-WEDLOCK PREGNANCY AND CHILDBEARING

by

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ABSTRACT

Although the United States birth rate and overall rates of out-of-wedlock childbearing have fallen dramatically since the 1960's, most of the decline in out-of-wedlock birth rates has occurred among women aged twenty or older. Out-of-wedlock rates have fallen only slightly among blacks aged 15-19, while they have risen slightly among whites of the same age. In 1974, 13 percent of all births -- 418,000 out of 3,160,000 total births -- occurred outside of marriage, over half to females under the age of 20.

These fertility trends are discussed in greater detail in the first chapter of this report. The consequences of o-w childbearing for parent, child, and society in general, are considered in Chapter Two. Although only scattered studies have been done, and although it is difficult to disentangle the effects of legitimacy status from those of poverty and the age of the parent at birth, it does appear that o-w childbearing is associated with earlier termination of formal education, with lowered economic attainment, with greater marital instability, and with increased health risks to mother and child. In addition, because many unwed parents cannot earn an adequate income, perhaps 60 percent end up receiving AFDC at any point in time. Given these consequences, as well as research indicating that the majority of people do not wish to become pregnant out of wedlock, exploration of the causes of the high incidence of o-w pregnancy is an interesting and important area of research.

Prior to beginning new work, a review of the relevant extant literature is presented in Chapter Three, organized around an accounting model framework. Within this framework, there is a discussion of declining marriage rates; high fecundity at early ages due to improved health and nutrition; evidence of rapidly changing sexual mores leading to more liberal attitudes regarding sex before marriage;

contraceptive availability and use among the unmarried; the increasing utilization of legal abortion; marriage to legitimate o-w conceptions; the declining proportion of children born out of wedlock who are given up for adoption; and the very high proportion of o-w children who end up requiring AFDC.

New analyses on two very different data sets are reported in Chapter Four. Work based on a micro data set (from a national probability sample of females aged 15 to 19 surveyed in 1971) views becoming an o-w parent as a process with three stages: commencement of sexual activity; conception among the sexually active; and pregnancy outcome among those who conceive.

Public policy variables, including AFDC benefits, AFDC acceptance rates, family planning services, and abortion availability, were not concluded to increase the likelihood that an unmarried virgin will have sexual intercourse. Teenagers were found to have a higher probability of making the transition as they become older, if their father (or male raiser) is relatively poorly-educated, if (among non-blacks) they live on the Pacific coast, if they are black, and if they are from a more recent birth cohort or a non-intact family.

A result with important ramifications is the documentation of a rapid increase in sexual activity among younger birth cohorts. This means that an increasingly large proportion of recent cohorts are exposed to the possibility of premarital pregnancy, forced marriage, abortion, or out-of-wedlock childbearing.

In the second stage, the probability of pregnancy among the group who are sexually experienced was examined. An annual probability of pregnancy was calculated to be 9 percent for whites aged 12 to 16, 12 percent for whites 17-19, 17 percent for blacks 12 to 16 and 24 percent for blacks 17-19. High state AFDC benefit levels and acceptance rates were not found to be associated with a greater probability of pregnancy. Nor was abortion availability found to encourage pregnancy. On the other hand, a <u>high unmet need</u> for subsidized family planning services was found related to a higher incidence among older black teenagers. Overall, the likelihood of conception was found to be highest among blacks, among females with relatively poorly-educated mothers, among those aged fifteen

or older (who are more fecund), and among females who did not live in intact families when they were aged 10 to 15. Teenagers who regard their religion as important to them, and black Catholics are slightly more likely to become pregnant. Longer exposure to sexual intercourse is also associated with a higher annual probability of conception. Little impact of individual contraceptive use was documented, probably because of the lack of detail in the variable available for analysis, but probably also because of the sporadic and ineffective use of contraceptives among adolescents.

Among those teenagers becoming premaritally pregnant, pregnancy outcome was most strongly affected by four factors. Young women living in states with relatively liberal abortion policies were significantly more likely to obtain abortions and, correspondingly, were less likely to bear a child out of wedlock or to marry to legitimate the pregnancy. Young women having college-educated fathers were also significantly more likely to obtain abortions. Those young women who desired their pregnancies were especially likely to marry. And black teenagers were far less likely to marry or obtain abortions and thus much more likely to carry their pregnancy to term outside of marriage.

It was possible to replicate a number of policy-relevant findings on a 1974 state-level data base constructed expressly for this analysis. State levels of AFDC benefits and the AFDC acceptance rate were not found to be related to the out-of-wedlock birth rates of states. On the other hand, black teenage out-of-wedlock birth rates were lower if subsidized family planning services were highly available and if teenagers were legally eligible to receive contraceptive services. White out-of-wedlock birth rates were lower in states with relatively easy access to abortion.

Overall, these analyses provide no evidence that AFDC benefits serve as an economic incentive to childbearing outside of marriage. On the other hand, they point to the impact of liberal family planning and abortion policies in reducing the incidence of out-of-wedlock childbearing.

PREFACE

The research forming the basis for this report was carried out under grant number 014B-7502-P2021 from the U. S. Department of Health, Education, and Welfare, Assistant Secretary for Planning and Evaluation. This support is gratefully acknowledged.

Kristin A. Moore had major responsibility for the work reported here. She not only completed the extensive review of the literature on out-of-wedlock fertility but was also involved in carrying through and writing up all phases of the analysis. She received substantial assistance from Steven Caldwell, who was responsible for much of the analysis of the Zelnik and Kantner data in Chapter IV. The research was under the overall direction of Isabel Sawhill, who contributed to the formulation of the basic model and reviewed several earlier drafts.

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CHAPTER I: INTRODUCTION

A. Scope and Importance of the Topic

Although most societies have strongly preferred that childbearing take place within marriage, out-of-wedlock pregnancies nearly always occur. However, the incidence and social acceptance of nonmarital childbearing varies greatly over time and across cultures. For example, in societies with early marriage and strict supervision of the young female, such as India, childbearing outside of marriage is extremely rare. On the other hand, in some countries with a low proportion of the population married, poor birth control and a great deal of sexual freedom, as in Jamaica, a majority of the births occur out of wedlock.[1/]

In the United States, out-of-wedlock [o-w] births have accounted for only a small proportion of total births, although the proportion has varied greatly across racial, ethnic and class groups. The proportion of children born out-of-wedlock has also increased substantially over the past quarter of a century. In 1974, 13 percent of all children were born out of wedlock as compared with about 5 percent in the late 1950's. Although there have recently been signs of a decline in out-of-wedlock birth rates, especially among older women, married couples have reduced their fertility even faster than unmarried women so that the component of total fertility accounted for by out-of-wedlock births has risen steadily.

Compared to the extensive research literature developed on marital fertility over the past several decades, data on o-w childbearing are scattered and fragmented; however some general conclusions can be drawn. Evidence from varied sources suggests that the majority of out-of-wedlock births are not planned or intended at the time they occur. In addition, it appears that an o-w conception places a considerable burden on the parent(s), whether the pregnancy is legitimated by marriage or not, and tends, consequently, to also pose problems for society in general. For example, o-w conceptions that force early marriage are related to a higher incidence of later economic problems and to an increased likelihood of divorce. Early, nonmarital pregnancy is also associated with an increased incidence of infant mortality and health problems, and with the occupational and educational retardation of the parent(s). Finally, out-of-wedlock pregnancy as a factor precipitating establishment of an impoverished single-parent family is an outcome of considerable concern to policy-makers; in 1973, 46 percent of the families receiving AFDC contained at least one out-of-wedlock child.

It is not clear to what extent these kinds of problems arise from early childbearing, unwanted childbearing or out-of-wedlock childbearing. Nor is it clear what type of policy response is available or appropriate. Pregnancy and childbearing in the United States have traditionally been considered to be very private domains of activity. The Supreme Court has legitimated this traditional posture, justifying the public's access to contraception and to abortion on the grounds of a Constitutional right to privacy. This would imply that government policies regarding fertility should be neutral, yet it seems that many existing programs may inadvertently encourage childbearing out of wedlock or fail to provide the sexually active, unmarried person with the means to control their fertility. For example, financial subsidization of an unborn

child (under AFDC) but not of abortion (under Medicaid) may provide an incentive to continue rather than terminate a pregnancy. Similarly, provision of AFDC benefits to an unmarried mother, but not to an intact family, may discourage marriage among the premaritally pregnant. Little is known about the impact of these programs on out-of-wedlock fertility. Indeed, there is a general need for more information about all of the determinants of sexual and reproductive behavior outside of marriage. Given the development of highly efficient methods of contraception and the recent legalization of abortion, one might expect out-of-wedlock birth rates to have fallen dramatically, yet even among women aged 20-24, one in ten births occurs out-of-wedlock. Is the incidence of out-of-wedlock childbearing in the United States a cause for concern? What factors are associated with bearing a child out-of-wedlock? Do policy variables have an impact on the incidence of out-of-wedlock childbearing? The current research effort represents an effort to answer these questions.

Before proceeding with a new analysis of this topic, this report will review what is currently known about out-of-wedlock childbearing. The remainder of this chapter is devoted to a review of the trends in out-of-wedlock fertility in the United States. Chapter II presents a more extensive review of the consequences of out-of-wedlock childbearing.

In the third chapter, a model of the process of out-of-wedlock childbearing is introduced. Included is a discussion of the extant literature on the causes of out-of-wedlock fertility, organized around the stages leading up to the creation of a mother-child unit on welfare: initiation of sexual activity; conception; birth; and the emergence of a new female-headed family on welfare. In the course of this discussion, the gaps in our current understanding will become evident. The last chapter reports on new research conducted this year in an attempt to fill at least some of these gaps. This empirical analysis is also organized around the model of out-of-wedlock child-

bearing and is based on two sources of data: a national probability sample of adolescent women surveyed by Kantner & Zelnik in 1971 and a 1974 state data file constructed at the Urban Institute from a variety of data sources. Both sets of data are used to examine the determinants of out-of-wedlock fertility and especially the influence of policy variables on reproductive behavior.

Chapter V summarizes the results of the analysis and suggests its implications for policy and for further research.

B. The Incidence of Out-of-Wedlock Fertility

1. Measures of Out-of-Wedlock Fertility: Rates and Ratios

Out-of-wedlock fertility is measured in two different ways -- rates and ratios. The rate summarizes the number of births per 1,000 unmarried women, usually within some specified age range. For example, in 1974, there were 11.8 births for every 1,000 unmarried white females aged 15-44 (see Table 2).

The ratio reports the number of o-w births per 1,000 total births. In 1974, for example, the ratio was 65.4 o-w births per 1,000 total white births (see Table 1). The magnitude of the ratio is affected, of course, by the proportion of women who are married and by the level of marital fertility. If few women are married, or if the fertility of married women is especially low, then the same number of o-w births will constitute a higher proportion of all births than it would if marriage were general and/or marital fertility were high. Rates and ratios thus provide quite different information. If one were concerned with the magnitude of o-w fertility relative to total fertility, then the ratio would be the preferable measure. To examine the incidence of pregnancy and childbearing among unmarried females, on the other hand, the rate is the appropriate measure. Data on o-w fertility will be presented with both rates and ratios; it will be noted that the trends over time differ for the two measures.

2. Trends in Out-of-Wedlock Childbearing Over Time

Overall trends in o-w fertility rates and ratios are reported in Tables 1 and 2 for the United States from 1920 up to the most recent time period for which data are available. The statistics are presented separately for whites and nonwhites because the incidence of o-w childbearing varies greatly by race, for a variety of reasons that will be discussed later.

Considering ratios first (see Table 1), it is clear that the proportion of all births that occur outside marriage has risen substantially and steadily over time. In 1974, over 6 percent of all white births and over 40 percent of all nonwhite births occurred outside marriage. This does not necessarily mean, however, that the incidence of o-w childbearing is rising since, as noted earlier, a decline in marital fertility can result in an increase in the ratio. An unparalleled decline in marital fertility did indeed occur during this time period, and accounts for the steady increase in the proportion of all births that occur out-of-wedlock (see Table 3). This increase has occurred in all age groups.

Table 2 documents the long-term rise and the recent decline in the rate of o-w childbearing. Although o-w childbearing has been,and is,a much more frequent phenomenon among nonwhites, the overall trends have been similar for both racial groups, rising steadily through about 1970 and then falling slightly. Despite the recent decline, however, o-w birth rates still have not fallen to the level of the early 1950's.

An important question is whether the long-run increase in o-w births is general or simply a sub-group phenomenon. United States Vital Statistics data on o-w births are not collected with much detail; fortunately, however, the age of the mother is recorded, and this bit of information is of considerable interest. Tables 4 and 5 present data on o-w birth rates by age of mother for the years 1955 through 1974. It is clear that rates have fallen substantially among every age group except for the youngest. Among nonwhite women aged 15 to 19, o-w fertility has declined only slightly (for two years). Among young white

TABLE 1. Ratio of Out-of-Wedlock Births to Total Births -- U.S. : 1920-1974
(Out-of-Wedlock births per 1,000 total births)

Year	Whites	Nonwhites
1920	15.0	125.0
1930	18.6	141.1
1940	19.8	166.4
1945	23.6	179.3
1950	17.5	179.5
1955	18.6	202.4
1960	22.9	215.8
1965	39.7	263.2
1968	53.3	312.0
1969	54.7	325.1
1970	56.6	349.3
1971	56.1	373.3
1972	60.4	402.6
1973	63.9	416.9
1974	65.4	427.3

Source: 1920-1968 from Cutright, 1972, Table 1; 1969-70 from Vital Statistics of the U.S., 1970, Table 1-29; 1971-1973 from Monthly Vital Statistics Report. Vol. 23, No. 11 (January 30, 1975), Table 11.

TABLE 2. Out-of-Wedlock Birth Rates -- U.S.: 1920-1974
(Births per 1,000 unmarried women aged 15-44)

Year	Whites	Nonwhites
1920	4.4	41.5
1930	4.3	31.6
1940	3.9	39.1
1945	5.5	45.4
1950	6.1	68.9
1955	7.9	83.2
1960	9.3	90.2
1965	11.5	94.4
1968	13.0	83.0
1969	13.5	86.6
1970	13.9	89.9
1971	12.5	90.6
1972	12.0	86.9
1973	11.9	84.2
1974	11.8	81.5

Source: 1920-1968 from Cutright, 1972, Table 2; 1969-70 from Vital Statistics of the U.S., 1970, Table 1-30; 1971-1973 from Monthly Vital Statistics Report, Vol. 23, No. 11 (January 30, 1975) Table 11.

TABLE 3: Estimated Ratios of Out-of-Wedlock to Total Births by Mother's Age and Race: U.S. 1961, 1965, 1968, 1970, 1973, 1974

(Out-of-Wedlock births per 1,000 total births)

	Out-of-Wedlock Births Per 1,000 live Births						
Mother's age	All ages	<15	15-19	20-24	25-29	30-34	35-39	40+
Total								
1961	56	697	155	51	31	29	31	32
1965	77	785	208	68	40	37	40	43
1968	97	810	267	83	39	41	47	51
1970	107	808	295	89	41	45	52	57
1973	130	848	339	108	49	50	65	79
1974	132	846	354	111	49	50	70	78
White								
1961	25	499	158	24	13	11	14	17
1965	40	573	114	38	19	16	19	22
1968	53	610	77	51	20	21	25	28
1970	57	579	171	52	21	21	27	33
1973	64	652	191	53	24	24	33	41
1974	65	653	202	54	23	24	36	43
Nonwhite								
1961	223	817	439	209	168	155	157	157
1965	263	864	492	230	163	149	149	140
1968	312	908	550	264	144	132	130	127
1970	349	942	614	295	181	173	169	169
1973	417	968	691	359	218	194	202	200
1974	427	977	717	372	220	197	209	209

Source: Table 5, in Jane Menken, "The Health and Demographic Consequences of Adolescent Pregnancy and Childbearing," unpublished paper (1975). 1974 data from National Center for Health Statistics, Monthly Vital Statistics Report - Advance Report, Final Natality Statistics, 1974, Vol. 24, No. 11, February 13, 1976, Table 11.

TABLE 4: Out-of-Wedlock Birth Rates in the U.S., by Age of Mother: 1955-1974, Whites

(Births per 1,000 unmarried females in age group)

	Age						
Year	15-19	20-24	25-29	30-34	35-39*	35-44*	40+*
1974	11.1	15.2	14.9	9.6	5.5	-	1.5
1973	10.7	15.6	16.1	10.7	5.9	-	1.7
1972	10.5	16.7	16.6	12.1	6.4	-	1.6
1971	10.3	18.8	18.6	13.3	-	4.2	-
1970	10.9	22.5	21.1	14.2	7.6	-	2.0
1969	10.0	23.0	22.4	15.1	7.6	-	2.0
1968	9.8	23.1	22.1	15.1	-	4.1	-
1967	9.0	23.1	22.7	14.0	-	4.2	-
1966	8.5	22.5	23.5	15.7	-	4.2	-
1965	7.9	22.1	24.3	16.6	-	4.9	-
1964	7.3	21.2	24.1	15.9	-	4.8	-
1963	7.0	20.8	22.0	14.2	-	4.6	-
1962	6.5	20.0	19.8	12.6	-	4.3	-
1961	7.0	19.7	19.4	11.3	-	4.2	-
1960	6.6	18.2	18.2	10.8	-	3.9	-
1959	6.5	18.3	17.6	10.7	-	3.6	-
1958	6.3	17.3	15.8	10.8	-	3.4	-
1957	6.4	16.6	14.6	10.5	-	3.0	-
1956	6.2	16.3	14.0	9.2	-	3.0	-
1955	6.0	15.0	13.3	8.6	-	2.8	-

Sources: Monthly Vital Statistics Report, summary report - natality statistics Vol. 24, No. 11, Feb. 13, 1976, Vol. 22, No. 12, March 20, 1974; Vol. 23, No. 8, Oct. 31, 1974; Vol. 23, No. 3, June 7, 1974, Vol. 22, No. 7, Oct. 2, 1973, 1970 Vital Statistics, "Trends on Illegitimacy - U.S. 1940-1965", H.E.W., February 1968, Table 2.

*Vital Statistics data reported for different age groupings in different years.

TABLE 5: Out-of-Wedlock Birth Rates in the U.S., by Age of Mother: 1955-1974, Nonwhites

(Births per 1,000 unmarried females in age group)

	Age						
Year	15-19	20-24	25-29	30-34	35-39*	35-44*	40+ *
1974	88.8	104.3	78.8	51.6	23.3	-	6.7
1973	89.7	108.9	82.4	56.4	20.2	-	7.2
1972	92.7	113.1	84.5	56.3	29.0	-	8.0
1971	92.4	121.0	93.3	65.7	-	21.6	-
1970	90.8	121.0	93.8	69.8	-	32.0	10.0
1969	85.6	116.6	98.0	73.5	-	34.7	10.0
1968	82.8	118.3	104.4	80.6	-	25.2	-
1967	80.2	128.2	118.4	97.2	-	28.9	-
1966	76.9	139.4	143.8	119.4	-	33.8	-
1965	75.8	152.6	164.7	137.[illegible]	-	39.0	-
1964	74.0	164.2	168.7	132.3	-	34.5	-
1963	73.8	161.8	171.5	124.3	-	34.4	-
1962	74.1	163.6	172.7	115.2	-	35.5	-
1961	77.6	169.6	172.7	112.2	-	37.4	-
1960	76.5	166.5	171.8	104.0	-	35.6	-
1959	80.8	167.8	168.0	106.5	-	34.9	-
1958	80.4	153.2	161.2	110.5	-	32.5	-
1957	81.4	147.7	142.6	115.1	-	30.3	-
1956	79.6	143.5	132.7	113.7	-	27.0	-
1955	77.6	133.0	125.2	100.9	-	25.3	-

Source: See Table 3.

*Vital Statistics data reported for different age groupings in different years.

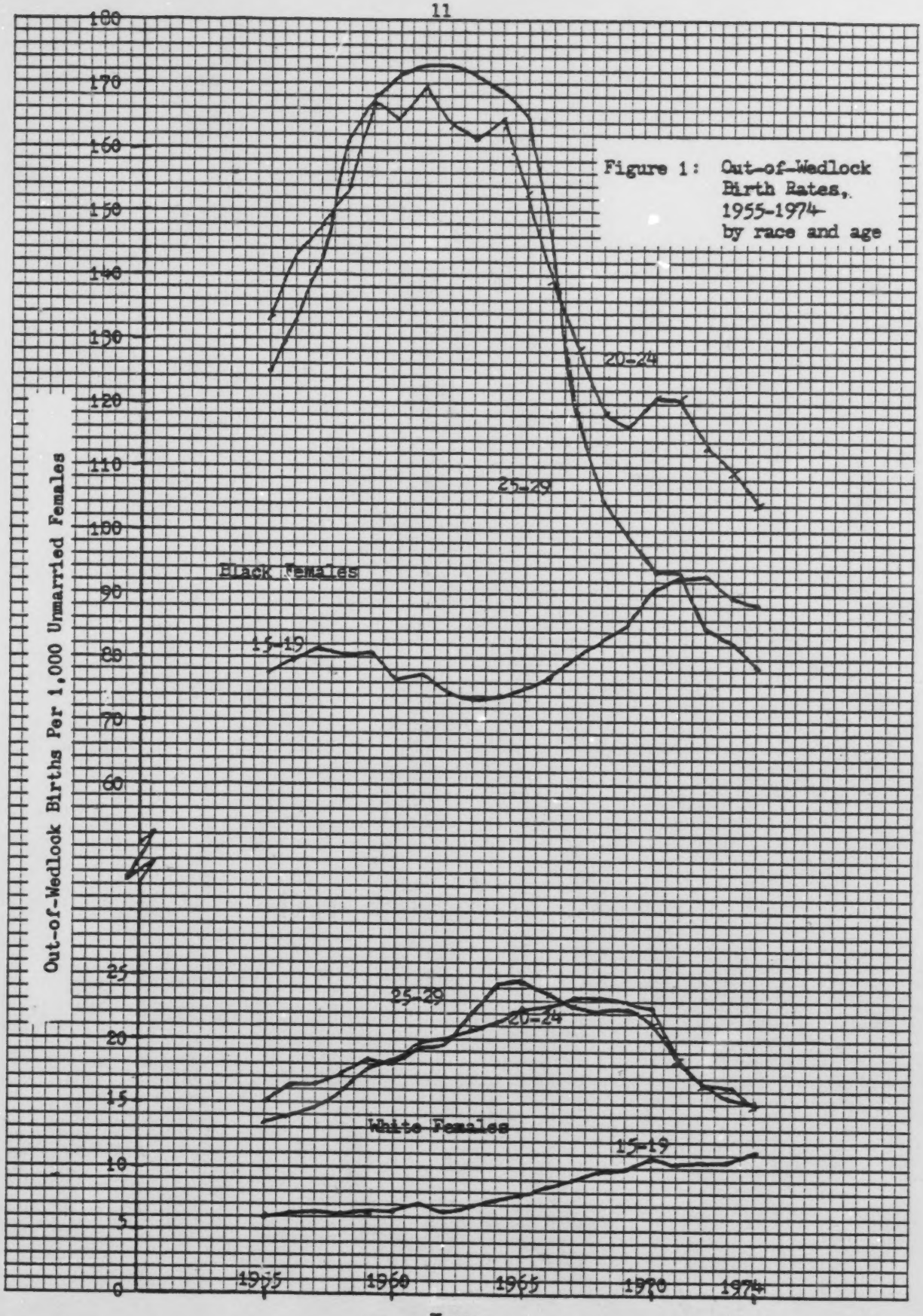


Figure 1: Out-of-Wedlock Birth Rates, 1955-1974 by race and age

women no decline is apparent at all. For some reason, the factors that have produced a decline in o-w childbearing among older age groups have not had a similar result among young women. It is these youngest women for whom a birth is most untimely and who can be least expected to be self-sufficient, stable parents. The number of births to this age group is not at all trivial. In 1974, girls under age 19 had over 220,000 live o-w births, more than half of the 418,000 o-w babies born in that year. (see Table 6).

The total number of o-w births to nonwhites is higher than the total to whites, although nonwhites comprise only a minority of the population. The white-nonwhite difference is most pronounced at younger ages. However, as noted earlier, o-w fertility rates at these ages are falling among nonwhites but not among whites. Nonwhites bore 249,600 o-w babies in 1974, 60 percent of the total.

The fact that the o-w fertility ratio is rising while the rate is falling suggests that marital fertility is falling more rapidly than non-marital fertility. Indeed, while the total number of births in the United States decreased by 3 percent from 1972 to 1974 (3,258,411 births to 3,159,958), the number of out-of-wedlock births increased by nearly 4 percent (from 403,200 to 418,100). Is the increasing incidence of o-w childbearing among young women a cause for concern? What are the consequences of o-w childbearing for parent, child, and society?

TABLE 6: Number of Out-of-Wedlock Births, by Age and Race of Mother, 1974

Age	White	Nonwhite
< 15	3,300	7,300
15-19	85,000	125,700
20-24	49,600	73,200
25-29	18,600	26,400
30-34	7,600	11,000
35-39	3,400	4,700
40+	1,000	1,300
	168,500	249,600

Total = 418,100

Source: National Center for Health Statistics, Monthly Vital Statistics Report - Advance Report, Final Natality Statistics, 1974, Vol. 24, No. 11, February 13, 1976, Table 11.

CHAPTER II: THE CONSEQUENCES OF OUT-OF-WEDLOCK FERTILITY FOR PARENT, CHILD AND SOCIETY

A. Infant Mortality and Morbidity

Legitimacy status per se is not known to have any causal effect on the health of an infant; however the social disadvantages so often linked with o-w childbearing result in considerably higher rates of morbidity and mortality. Consequently, out-of-wedlock babies tend to enter the world at a physical disadvantage, as well as at a social and economic disadvantage. The mothers of children born out of wedlock are often young and poor and lack access to adequate medical care. They may be ashamed to acknowledge their pregnancy and therefore do not receive necessary prenatal care. In addition, they are sometimes unaware that they are pregnant until the pregnancy is somewhat advanced and so do not begin prenatal care early enough. Finally, they may be too immature physically to carry a full-term gestation. Because of these factors, infant mortality is higher among o-w babies.

Data on infant mortality in the United States during the 1960's indicate that mortality for births to unmarried women exceeds that of births to married women for every age group except nonwhite mothers under age 20. In general, the difference in mortality by legitimacy status is greater for white as opposed to nonwhite births. The 1964-66 Infant Mortality Survey data indicate a mortality rate of 21 deaths per 1,000 live births among marital white births, compared with a rate of 34 deaths for non-marital infants.[2/] Among blacks, the mortality rates were 40 for marital and 45 for non-marital births. Being born black has a clearer disadvantage for an infant's survival chances than does being born out of wedlock; nevertheless, being born out of wedlock puts a child at a definite disadvantage from the very start.

Fetal deaths are also higher for non-marital conceptions compared to

marital pregnancies, except for nonwhites under age 15. Of course, fetal and infant mortality are generally higher among young mothers; but rates are higher among young unmarried females than among young married females.[3] Labor is harder for younger mothers as well. One study found 20 percent of patients under age 15 to endure 21 to 47 hours of labor, compared to 6.5 percent of women aged 19.[4]

One commonly used indicator of prematurity and associated problems is a low infant birth weight. Although normal birth weight varies among different ethnic groups, a low birth weight is still a good indicator of the aggregate risk of mortality and morbidity. A study done in Baltimore found that birth weight was lowest for unmarried black women who received no prenatal care, were of low socioeconomic status, under age 15, and delivering their first child.[5] This group manifests every trait that is associated with physical disadvantages: extreme youth, poverty and lack of medical attention-- all characteristics that unmarried women seem to have disproportionately relative to married women. Prematurity is not a trivial event, either. It has been linked to increased incidence of epilepsy, cerebral palsy, lower IQ, deafness, blindness, and relatively poor motor development.[6] Providing better health care for all pregnant women and encouraging early, frequent prenatal care would help reduce some of the problems of never-married mothers; however, the inadequate physical development of the extremely young mother probably indicates that the mortality and morbidity of their offspring will remain higher than that of women in the 18 to 29 age range.

B. Educational Attainment of the Unwed Mother

Disruption of her education is one of the most serious penalties that the young mother pays for becoming pregnant. A 1970 study of 17,000 school systems

found that scarcely one-third made provision for the continued instruction of pregnant students.[7] Cutright reports that the proportion of women who finish high school is considerably lower among both black and white women having o-w births. He does not feel that the pregnancy "caused" the early termination of education; however, his argument is only partially convincing. Clearly, some girls quit school and only later become pregnant. On the other hand, many girls become pregnant and then find that they cannot manage to complete their educations. Although resolution of the question of causality will have to await further research, data on never-married mothers from the 1967 Survey of Economic Opportunity show a clear association between pregnancy timing and mother's education.[8]

TABLE 7: Percent of Ever-Married Mothers Who Are High School Graduates, 1967, by Timing of First Birth and Race

First Birth	White	Non-White
Before Marriage	41%	25%
1-7 months after marriage	54	42
8-14 months " "	59	39
15-24 months " "	62	46
25+ months " "	66	44

Source: Tables 1 and 2 in Phillips Cutright, "Timing the First Birth: Does It Matter?", Journal of Marriage & The Family, Vol. 35, No. 4, (November 1973).

Furthermore, 1972 data provided by the National School Public Relations Association indicates that of the 210,000 school-age girls who became pregnant, 170,000 -- 81 percent -- will never return to formal education.[9] The National Alliance Concerned with School-Age Parents notes that pregnancy is the most frequent single reason that girls drop out of school, and that disruption of education occurs more frequently for the mother than the father.[10]

Presumably, fathering a child out of wedlock does not affect the educational attainment of the many men who do not marry the mother of their children, although no data are known to exist on this question. The schooling of men whose brides are pregnant has been studied, though, and researchers have found these men to be considerably less well-educated than men not involved in a premarital pregnancy. Again, however, the direction of causality is unclear. In the Detroit Family Growth Study, first conducted in 1962, fathers with premaritally conceived children were found less likely to have finished high school regardless of their age at marriage. This finding suggests that in many cases their education was terminated prior to the pregnancy. For example, among men aged 22 or older when they married, 50 percent of the husbands with premaritally pregnant wives failed to complete high school (see Table 8). Since women in the United States tend to pair with men several

TABLE 8: Years of School Completed by Husband, by Husband's Age at Marriage and Timing of First Pregnancy

	Years of School Completed by Husband				
	Less than 12	12	More than 12	Total	(n)
All Couples					
Premaritally Pregnant -------	45	34	21	100%	(208)
Not Premaritally Pregnant ---	24	37	39	100%	(845)
Husband Aged 16-19 at Marriage					
Premaritally Pregnant -------	54	39	7	100%	(56)
Not Premaritally Pregnant ---	50	33	16	100%	(94)
Husband Aged 20-22 at Marriage					
Premaritally Pregnant -------	37	37	26	100%	(90)
Not Premaritally Pregnant ---	25	44	32	100%	(304)
Husband Aged 23+ at Marriage					
Premaritally Pregnant -------	50	24	26	100%	(62)
Not Premaritally Pregnant ---	19	30	47	100%	(447)

Source: Adapted from Table 10 in L. Coombs et al, "Premarital Pregnancy and Status Before and After Marriage," American Journal of Sociology, Vol. 75, No. 5 (March, 1970), 800-20.

years older than themselves[11], it seems possible that pregnancy would be less of a cause of early termination of education among men, especially since many families exert special efforts to ensure the education of the male. Nevertheless, o-w pregnancy and low educational attainment are correlated both among males and among females. Further research will be necessary to untangle the causality and to explore whether the relationship differs for men and women.

C. Later Economic Status of the Family

The relationship between lower educational attainment and pregnancy out-of-wedlock for both wives and husbands suggests an association between premarital pregnancy and later economic status. Cutright, however, reports that timing and legitimacy status of the first pregnancy had little impact on whether a woman later found herself in a poverty income family. Among respondents in the 1967 Survey of Economic Opportunity, eighty-one percent of white mothers whose first child was born before her marriage were above the poverty line, compared to 93 percent of mothers having their first child at least two years after marriage (see Table 9). (Cutright does note that of the 30 never-married mothers, only half were above the poverty line.) The measure that he used -- a dichotomy of poverty/non-poverty -- is an extremely crude measure, though, and more detailed analyses do indicate a relationship.

TABLE 9: Percent of Ever-Married Mothers Above the Poverty Line by Timing of Their First Birth and Race, 1967

Timing of First Birth	Whites	(n)	Nonwhites	(n)
Before marriage	81%	386	59%	1,589
1-7 months	87%	956	65%	1,034
8-14 months	89%	3,491	60%	1,071
15-24 months	91%	2,325	71%	674
25+ months	93%	3,430	68%	975

Source: Tables 1 and 2 in P. Cutright, "Timing the First Birth: Does it Matter?" Journal of Marriage and the Family, Vol. 35, No. 4 (November 1973), 585-95.

Among the couples interviewed in the Detroit Family Growth Study,[12/] those couples whose first child was conceived before their marriage had a lower income and fewer assets, even when religion, age at marriage, marital duration, and education were controlled. For example, among families in which the husband graduated from college, income averaged $6,710 in families with a premarital conception relative to $8,820 for families not having a premarital conception. Assets were $4,530 for premaritally pregnant couples, compared with $8,470 for other couples. This difference occurred despite the fact that the premaritally pregnant couples received more help from their parents.

A number of factors could produce a negative association between premarital pregnancy and subsequent income and assets. Any pregnancy has the obvious effect of raising expenditures for food, clothing, medical care, and housing and also tends to reduce the labor force participation of the mother. These high expenses combined with low income make accumulation of assets very difficult. In addition, there may be a considerable reduction in the gifts of household goods and money that young people usually receive at weddings, showers, and on the birth of a child if there is no wedding or only a small and rather hurried wedding. Expenses that exceed income may require the early accumulation of debts which strain the family budget for years to come. Those who become pregnant out of wedlock may not be as effective planners, either for the short-term or long-term, or may lack experience in making careful decisions.

For a variety of such reasons, it seems likely that further analyses will support and extend the Detroit finding of a negative association between income and premarital pregnancy; however, it is possible that Cutright's perspective may also be supported. That is, while an o-w pregnancy has a negative impact on later income and assets, it may not have a sufficiently strong effect to put couples below the poverty line. This may imply that as long as a woman manages to get married and stay married, her attachment to a man

can keep her out of poverty. The mean income of female heads of families aged 25-44 in 1973 was $5,951, compared to $11,931 for male-headed families and $15,114 for husband-wife families.[13/] Lane and Morgan report marital disruption to be the most common manner of entering poverty status for female heads of households.[14/] Clearly, economic status is very much tied to marital status, especially for women. Thus, the inability of many women to obtain well-paid employment can mean that divorce, separation, and non-marriage thrust a mother into poverty.

The income of never-married women is likely to be even lower than the average for all female-headed households, since these women do not have the life insurance and survivors' benefits of widows or the alimony payments of divorcees; nor are they as likely to receive child support payments. The economic circumstances of never-married mothers have not been adequately documented. It is probable that, given their lower education and the lack of male assistance available to this group, poverty is a serious problem. Data reported in a working paper by Rein and Rainwater certainly support this expectation (see Table 10). Although the authors do not present information on their source or on sample composition, the data appear to be based on the Michigan Panel Study of Income Dynamics.

TABLE 10: Income of Mother-Headed Families, by Marital Status of the Mother

Total Family Income	Marital Status			
	Never-Married	Separated	Divorced	Widowed
< $3,000	30%	19%	13%	13%
$3,000-4,999	36%	33%	16%	25%
$5,000-7,499	19%	23%	31%	19%
$7,500+	15%	26%	40%	43%

Source: H. Heclo, L. Rainwater, M. Rein, and R. Weiss, "Single-Parent Families: Issues and Policies," unpublished working paper.

With such low incomes, it seems likely that many never-married mothers must resort to welfare. Data on the composition of the AFDC caseload suggest that this outcome is not uncommon. According to the 1973 AFDC survey, children whose father never married their mother comprise 32% of all AFDC children, an increase from 21 percent who were on AFDC for this reason in 1961.[15/] In 1973, federal expenditures on AFDC benefits totaled $7.2 billion.[16/] Although it is not precisely clear what proportion of this total went for the support of o-w children, it would appear that roughly two billion dollars were spent for this purpose. Thus the poverty of the never-married mother is not only a burden for her but a concern to government policy-makers as well.

Clearly, there is a need for more detailed data on this subject. Given the large number of national surveys that have collected data on fertility and income dynamics (e.g., the National Fertility Study and the Michigan Panel Study of Income Dynamics), it would seem that further analysis could be conducted on the association between o-w pregnancy and later family income fairly expeditiously. To evaluate the effect of o-w childbearing, it is important to distinguish the impact of young age at birth and socioeconomic factors from the effect of o-w conception per se (or include their interaction), since they tend to be associated. Researchers should also follow Cutright's example with respect to differentiating between births that occur before marriage from conceptions that are legitimated by marriage before the birth. In addition, given the paucity of information on the topic, the financial status of never-married mothers needs to be documented. Even if women who become premaritally pregnant marry and avoid poverty, it must be noted that premarital pregnancy is also associated with a higher probability of divorce, so the differential risk of poverty for an out-of-wedlock conception is not eliminated by marriage.

D. Marital Dissolution

Divorce rates are regularly found to be higher among couples who were pregnant at the time of the marriage. A longitudinal study of 1,304 couples included 59 couples who divorced during the course of the study. It was noted that of the couples who divorced, 41 percent were premaritally pregnant compared to 18 percent of the couples who remained married.[17] Cutright reports that premaritally pregnant couples who marry are twice as likely to divorce as other couples.[18] It is unclear, offhand, how much of this disadvantage is due simply to the pregnancy, since an early marriage forced by pregnancy is often associated with interrupted schooling and a young age at marriage, factors which, as noted, also present liabilities to a young couple trying to make a go of marriage. Bumpass and Sweet, in a study based on the 1970 National Fertility Study, have controlled for a variety of such factors. They report that after controlling for marital duration, age at marriage and years of schooling, premaritally pregnant whites still suffered marital disruption (divorce or separation) rates 2 percentage points higher than women whose first conception took place after marriage. These women who married were less likely to experience marital disruption, however, than women who became pregnant but did not marry until after the birth. Women with an o-w first birth had marital disruption rates 11 points higher than women with a post-marital first birth, even controlling for age at marriage, duration, and years of schooling.[19]

The ultimate costs of marital disruption are a subject of much contention. The financial costs seem quite well-established,[20] but there is disagreement as to the social and psychological costs. It is clear, however, that the dislocations and trauma of disagreement, unhappiness, separation, and reconstruction are at the very least a temporary disability. Although this issue may never be neatly quantified and resolved, most

people seem likely to agree that a stable, harmonious relationship is preferable to a marriage marked by dissatisfaction and eventually by divorce, even if that divorce is followed by a second, satisfactory marriage.

E. The Impact of Being Born Out of Wedlock on the Child

Although it seems highly likely that the disadvantaged environment that tends to be the lot of the o-w child has an impact on its development, very little empirical research concerning the long-term impact of being born out of wedlock has been unearthed. A study published in Toronto in 1943 reported that 47 percent of 92 o-w children showed "maladjustment" as teenagers, and that more than 20 percent seemed to manifest serious behavior problems; however, no comparisons with children born within marriage were made.[21/] A second study compared children born within marriage with children born outside marriage. The children were all black AFDC recipients in the same Missouri county. Children born out of wedlock were found to score lower in intelligence, teachers' ratings, academic grades, several California Test of Personality scales, and on age-grade placement. Only school absence did not differ between the two groups. In addition, the differences were greater among the older children, suggesting that deterioration may occur over time.[22/]

Clearly, a crucial variable affecting consequences for the child is whether or not the pregnancy was wanted. Fragmentary evidence suggests that a majority of non-marital births are unwanted. One study found 90 percent of a sample of black AFDC mothers with o-w children defined the births as unwanted.[23/] Kantner and Zelnik found that of the unmarried girls 15-19 in their national probability survey sample, both black and white, who became pregnant, 73 percent had not intended the pregnancy.[24/] Bernstein and Meezan report that only 38 percent of the unmarried AFDC mothers that they interviewed felt happy or pleased when they learned of their pregnancy.[25/] Thus

it would seem that generally the o-w child is not a wanted child; and several studies have indicated that the unwanted child suffers some disadvantage. Newell reports that the behavior of mothers who stated that their child had been unwelcome alternated between overprotectiveness and hostile behavior.[26] Robson and Moss report from a small, clinically-oriented study that six of the nine mothers late in the development of attachment for their infant were women who "simply did not want their babies."[27]

An unusually careful study conducted in Czechoslovakia compared children born after their mothers were denied an abortion with children matched for grade in school, sex, birth order, number of siblings, marital status of the mother, and father's occupation. Raters were unaware of which group the child belonged to. Gross differences in adjustment between the groups of children were not discovered; however researchers noted several differences. They conclude:

> The higher incidence of illness and hospitalization, despite the same biological start in life, slightly poorer school marks and performance despite the same level of intelligence, somewhat worse integration into the peer group -- all these point to a higher-risk situation for the child and the family, as well as for society... The gross data available so far reveal that boys born from unwanted pregnancies are more endangered in the development of their personalities than girls, although there are no marked differences between the sexes on indicators concerning the biological foundation (initial physical condition).[28]

It is noteworthy that these data are based on 220 cases in which children were born and raised by the mother, out of 555 cases in which abortion requests were twice denied. The case base was diminished by 43 women who obtained legal abortions elsewhere, 80 reportedly spontaneous abortions, 6 infant deaths, 19 adoptions, 2 children who were permanently placed in institutions, 6 women who were

found not to have been pregnant, and 149 women who had moved from Prague or could not be located for other reasons. The population of the live births that were actually studied probably constitutes, then, the least unwanted of the unwanted, since so many of the women managed to avoid bearing or raising their unwanted child. In addition, the women were denied abortions presumably in part because they were judged to be able to handle the pregnancy; and nearly all of the women had been married (though their family situations tended to be relatively unstable). The main factor working against these children appears, then, to be their unwanted status. The children in the study are currently nine years old and, hopefully, subsequent reports on their development will be forthcoming. Although further work should be done on this question -- for example, exploring sub-group differences -- it would appear that unwanted children are disadvantaged by their unwanted status. And it is not difficult to conjecture why that would be so.

To the extent that the experience of o-w motherhood is difficult, frightening, and lonely for the mother, the child may find itself in the guardianship of a parent with emotional problems. Given the lack of both personal and economic resources available to the unmarried, these problems may produce considerable personal disorganization. We know that fathers infrequently contribute child support; it seems unlikely that many provide significant emotional support. Only 12 percent of the unmarried welfare mothers studied by Bernstein and Meezan still maintained a relationship with the father of their child,[29/] a proportion very similar to that found by researchers conducting a study of unmarried mothers who kept their child.[30/] The circumstances of children in families formed by the marriage of their mother with a man other than their father are not known.

Motherhood at best is a tiring and demanding task which could easily become a source of great unhappiness if adequate financial, social, and

emotional supports do not exist. To what extent does the unhappy parent project her or his anger on to the child, blaming it for the dissatisfying circumstances of the parent's life? One study suggests that o-w children are 3½ times more likely to be victims of child abuse than their proportion in the population would imply.[31] This finding is supported by a Massachusetts study in which 50 percent of 115 abused children were found to have been conceived premaritally.[32] Gelles writes, "The unwanted child can become the receiver of a parent's aggression... because the unwanted child is, in fact, a source of stress for the family. The abusive parent is not lashing out at a projected source of his troubles, he is beating a concrete source of family stress."[33] Being born out of wedlock and being unwanted are, of course, not synonymous; but they do seem to be closely intertwined, with each factor posing considerable disadvantage to the child.

Other effects on the child of being born out of wedlock can be extrapolated from related lines of research. As reported above, statistics indicate that a child conceived out of wedlock is more likely to die in spontaneous abortion, at birth, or as an infant. It is also more likely to be intentionally aborted.[34] It is more likely to be impoverished, whether raised by just one of its parents or by both. If its parents do marry, the child is more likely to have to endure the divorce of its parents. In addition, Cutright reports[35] that women who conceive their first child out of wedlock tend to have larger families than women who conceive their first child after

TABLE 11: Deviations From Average Family Size, Controlling Education, Age of Mother at First Birth, and Residence, by Race of Mother

	White	Nonwhite
First birth before marriage	.43	-.04
Pregnant at marriage	.50	.56
First birth in 8-14 months	.34	.51
First birth in 15-24 months	.06	-.26
First birth after 25 months	-.53	-.45

being married for some months (see Table 11). Furthermore, it has been repeatedly documented that children from large families have lower I.Q. scores, poorer academic performance, and lower achievement motivation scores, even controlling for social class, than do children from smaller families,[36] though once again the causal chain is unclear.[37]

A composite picture formed from the various fragmentary pieces would suggest that the costs of o-w childbearing to parent, child and society are rather high. It would appear, then, that a trend toward rising rates of o-w births is not a particularly desirable phenomenon. Why has the incidence of o-w childbearing risen over the last quarter of a century? There is no one, clear reason, of course. Indeed, the reasons are not clear at all. A model explaining the incidence of out-of-wedlock fertility will be presented and discussed in the next section, with particular attention to variables that are amenable to policy intervention; but it will be clear early on that there is a great need for additional work on this issue.

CHAPTER III: THE DETERMINANTS OF OUT-OF-WEDLOCK FERTILITY: AN ACCOUNTING MODEL AND A REVIEW OF THE LITERATURE

A. A Model of Out-of-Wedlock Fertility

Bearing a child out of wedlock can usefully be seen as the end-product of a long and complicated process, one that involves decisions about becoming sexually active, about using contraception, and if pregnant, decisions about an abortion, about marriage,and about adoption. In addition to the various decisions that people make in a more or less free and informed way, the process is influenced by factors outside the personal control of the participants, such as, the fecundity of the couple or the occurrence of a miscarriage. Although it is not possible to predict whether a particular woman who skips contraception on a particular occasion will become pregnant, it is possible to develop aggregate probabilities. That is, of 100 sexually inexperienced females of a given age, how many will become sexually active during a given time period, and of these how many will become pregnant? Of those becoming pregnant, how many will abort? And so forth.

A model is proposed here that traces the process of becoming a parent out of wedlock. It is an "accounting" model in the sense that estimates of the probability of making the transition from one stage to another are used to produce a count of the numbers of individuals who have progressed through the different stages of the process. The elements of the basic model are presented on the following page, and the model is illustrated in Figure 2 for never-married females.

$$IB = P_{risk} \times \frac{C}{P_{risk}} \times \frac{LB}{C} \times \frac{IB}{LB}$$

Where:

P_{risk} = population at risk: the number of sexually active and fecund females who are not currently married

$$P_{risk} = P_{total} \cdot SA \cdot F$$

SA = proportion sexually active
F = proportion of sexually active who are fecund
P_{total} = number of females not currently married

C = number of conceptions: the number of females at risk who become pregnant

$$C = P_{risk} (P_{nx} \cdot P_{c/nx} + P_x \cdot P_{c/x})$$

P_{nx} = proportion not using contraception
$P_{c/nx}$ = proportion who get pregnant given that they do not use contraception
P_x = proportion using contraception
$P_{c/x}$ = proportion who get pregnant given that they use contraception

LB = number of live births: the number of conceptions that are not aborted

$$LB = C \times (1 - LA - IA - S_pA)$$

LA = proportion of pregnancies legally aborted
IA = proportion of pregnancies illegally aborted
SpA = proportion of pregnancies spontaneously aborted

IB = number of illegitimate births: the number of live births that are not legitimated by marriage.

$$IB = LB \times NM$$

NM = proportion of live births not legitimated by marriage

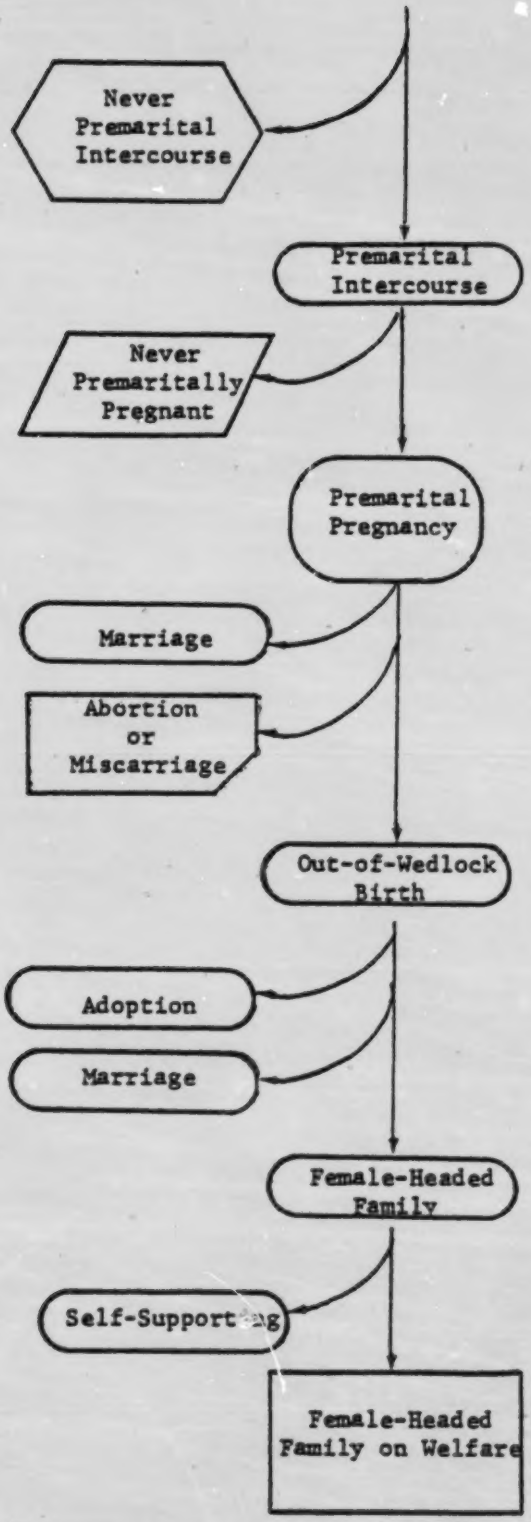


FIGURE 2:

MODEL OF OUT-OF-WEDLOCK CHILDBEARING PROCESS

Having arrived at an estimate of the number of o-w births, it is still necessary to explore the family and support situation of the out-of-wedlock child -- whether the mother keeps and supports the child herself; whether the mother keeps the child and receives welfare; or whether the mother gives up custody of the child. The outcome of greatest public policy concern is the proportion of women who keep their child and support it with welfare benefits, that is, who become female-headed households on welfare.

$$FHH\text{-}W = IB \times \bar{A} \times FHH\text{-}\bar{S}$$

FHH-W = the number of female headed households on welfare

$\bar{A}$ = proportion of children not given away to adoptive or foster parents

$FHH\text{-}\bar{S}$ = the proportion of female-headed households not supported by own or family earnings

The estimation of these various proportions is a difficult task. The data are limited, and in some instances no data are available at all. In other cases estimates can be reached only if dubious assumptions are made. The ensuing discussion of o-w fertility is organized around the several equations.

B. The Population at Risk: P_{risk}

1. The Total Number of Unmarried Females: P_{total}

The possibility of bearing an out-of-wedlock child is restricted, by definition, to the unmarried members of the population. It follows that a country with early and universal marriage will have little potential for out-of-wedlock childbearing. Low marriage rates, on the other hand, leave a large proportion of the population at risk. A related factor is the proportion of the population below the usual age of marriage. A population that has experienced high recent birth rates will have a large proportion of young people, which increases its potential for out-of-wedlock childbearing.

The number of o-w_births occurring in the United States has risen almost inevitably as the number of young women in the population has increased. In 1960, there were 5.5 million girls aged 14-17; by 1970, there were 7.7 million. Their proportion in the population rose from 6.1 percent to 7.5 percent. The number of young women aged 18-20 increased from 3.6 million to 5.5 million — from 3.9 to 5.3 percent of the population. Demographers predicted that the number of o-w births would rise simply because of the increased number of young people at risk of an o-w conception.

In 1968, the Census Bureau published an extrapolation of the number of o-w births that could be expected through 1980 if o-w fertility rates and the proportion unmarried, by age, remained constant. That is to say, a projection was made taking account of only the growth and changing age distribution of the population. An increase in the number of o-w births from 291,000 in 1965 to over 400,000 in 1980 was predicted as a result of the greater number of unmarried women of reproductive age.[38/] By 1973 (the most recent year for which Vital Statistics data on o-w births are available), the Census Bureau's estimate was already too low by approximately 60,000 births. One reason that their estimate was too low is that marriage rates fell.

Table 12 presents data on the proportion of teenagers 15-19 ever-married for the United States from 1900 through 1970. The data for 1950 indicate the sharp rise in marriage rates among young people following World War II. The proportion of young females married declined slightly between 1950 and 1960 and then dramatically between 1960 and 1970.

Table 12. Percent of Teenagers Ever Married, United States, 1900-1970

Year	% Ever Married, Aged 15-19					
	All Races		White		Nonwhite	
	Male	Female	Male	Female	Male	Female
1900	1.0	11.3	0.9	10.4	1.9	17.0
1910	1.2	11.7	1.0	10.7	2.3	18.4
1920	2.1	12.9	1.9	11.8	4.0	21.2
1930	1.8	13.1	1.5	11.8	3.6	21.9
1940	1.7	11.9	1.6	10.9	3.2	19.0
1950	3.3	17.1	3.2	16.5	4.4	21.1
1960	3.9	16.1	3.9	16.1	3.8	16.2
1970	4.1	11.9	4.1	12.0	4.5	11.3

Source: J. Sklaar and B. Berkov, "Teenage Family Formation in Postwar America," Family Planning Perspectives, Vol. 6, No. 2, Spring 1974, Table 2, page 82.

There has been a corresponding increase in the median age at marriage for women, from 20.3 in 1950 to 21.0 in 1973.[39/] Thus, in addition to the fact that there are more young people in the population, a greater proportion of these young people are unmarried and at risk of an out-of-wedlock pregnancy. Table 13 presents data on the number and proportion of single females in various age groups in the United States.

Table 13: The Number and Proportion of U.S. Females Never-Married, 1970

Age	Number of Never Married Females	Total Number of Females	Percent of All Females Never Married
14-17	7,522,000	7,728,000	97
18-19	2,688,000	3,561,000	76
20-24	3,012,000	8,386,000	36
25-29	732,000	6,854,000	11
30-34	367,000	5,774,000	6
35-44	614,000	11,782,000	5
	14,935,000	44,085,000	

Source: Statistical Abstract of the U.S. 1971, Table 38, p. 32.

As noted in Table 5, the largest absolute number of o-w births occurs to females aged 15-19. This is not surprising considering that the great majority of this age group are unmarried and thus at risk of an o-w birth.

In 1970, there were nearly 15 million unmarried women aged 14-44 in the United States, approximately 10 million of them aged 14-19. This is the total population eligible or P_{total}. These data for P_{total} do not represent the true population at risk of o-w childbearing, however, since not all of them are fecund or sexually active.

It is extremely difficult to estimate accurately what proportion of the unmarried are actually at risk of an o-w birth, since not all are sexually active. Also, the degree of risk varies depending on level of sexual activity. Estimates of sexual experience need to include information on frequency of intercourse and need to be updated regularly, since rapid change in sexual mores seems to be occurring. In addition, not all women, especially very young women and women over 44, are fecund.

2. The Proportion Who Are Fecund: F

The measurement of fecundity --the capacity to reproduce -- is more difficult than the measurement of fertility -- actual reproduction -- because fecundity is unobservable. Childlessness can not be assumed to be an indicator of the lack of fecundity, since voluntary childlessness is not uncommon. A study of Indianapolis couples found 16 percent of the couples to be childless, 40 percent of them by choice.[40/] On the other hand, as low as 3 percent of a population has been reported childless (in rural Minnesota).[41/] The incidence of childlessness varies by age at marriage, being higher for late marriers,[42/] and probably differs between the married and nonmarried population if one assumes that some health-related selection factor influences the likelihood of marriage.[43/] Nonfecundity due to physiological

causes is generally assumed to range between 5 and 10 percent but to increase with age; impaired fecundity is more likely among older women.[44/]

The total level of nonfecundity is actually considerably higher, however, due to sterilization. Several researchers have estimated the fecundity status of couples. Table 14 presents data for all couples, by race, who participated in a fertility survey of the U.S.[45/]

TABLE 14: Fecundity Status of Couples, by Race

	White	Nonwhite
Fecund	69%	67%
Subfecund	31%	33%
Definitely Sterile	11%	6%
Probably Sterile	4%	7%
Possibly Sterile	8%	13%
Possibly Fecund	8%	6%

Table 15 presents data, by age, on the proportion of couples that are fecund. Clearly age reduces fecundity, in part because older couples take deliberate steps to reduce their fecundity but in part due to the aging process.

TABLE 15: Percent of Couples Who Are Fecund, by Age of Wife

Age	All Couples	Age	White	Nonwhite
18-19	93%	15-19	77%	79%
20-24	86%	20-24	88%	88%
25-29	79%	25-29	79%	79%
30-34	64%	30-34	64%	64%
35-39	53%	35-39	53%	53%
		40-44	35%	35%
18-44	69	15-44	73%	73%

Source: Whelpton et.al., 1966, p.161.

Source: Cutright, 1972, p. 394.

It is of interest to note that the overall proportion of couples who are fecund does not seem to vary greatly by race. The fecundity of blacks in the United States seems to have been enhanced during the last several decades by improvements in health care. Medical treatment of venereal and other diseases, for example, has reduced the incidence of sterility. Farley[46/] has argued that since voluntary childlessness is a relatively rare event among blacks, the incidence of childlessness gives a reasonable estimate of sterility. Of black women born between 1835 and 1844, only about 10 percent were childless compared with one-third of black women born between 1905 and 1909, a cohort among whom venereal disease seems to have been widespread. However, the depressing impact of untreated disease on the level of black fertility probably affected early o-w fertility less than late fertility. At any rate, the differences between blacks and whites due to health conditions seem to have virtually disappeared by 1960,[47/] and therefore the same set of estimates can be used for whites as for nonwhites.

The extent to which these data can be generalized to the unmarried population is unknown. Presumably, unmarried people are less likely to have had sterilizing operations, but they may also be less healthy (if it is true, as some suggest, that the more healthy are selected for marriage). Women aged 30 or older account for only 8 percent of all o-w fertility, however (see Table 6), so the effect of error in fecundity estimates at older ages is likely to be slight.

The fecundity of young women is a variable of major importance, however, and a considerable portion of the recent increase in o-w childbearing has been attributed to a decline in the age of menarche. Hartley[48/] reports that the mean age of the onset of menstruation in the United States was about seventeen a century ago, compared to 12½ in the 1960's. Cutright[49/] estimates that in

1940 the mean age of menarche was 13.5. Assuming that fertility is not attained for 2½ years, on the average, after first menstruation, he calculates that 37 percent of females aged 15½ were fully fecund in 1940, compared with 69 percent in 1968.

The earlier arrival of sexual maturity naturally increases the incidence of pregnancy, irrespective of any increase in sexual activity (assuming that there is some sexual activity occurring); this point has been noted by several writers. The extent to which early maturation increases a girl's interest in and desire for sexual activity has, however, never been commented on, it appears. It is possible that today's young women are not only fecund at an earlier age, but are also interested in sex at an earlier age. As girls mature earlier, they are sexually desirable at a younger age as well. Since these physiological changes have occurred along with increased societal permissiveness in dress, activity, and values, it is difficult to sort out the relative contributions of these several factors. However, it is clear that improved health and nutrition have had an effect in increasing the incidence of o-w and early childbearing. Table 16 indicates the proportion of young women fully fecund at a given age in 1940 and in 1968. These more detailed data will be used for females under age 20, since the year to year change is so great. (These figures may represent slight overestimates, since they do not take into account the fecundity of the male partner; interestingly, male fecundity is not generally considered in the literature on non-marital fertility.) The 2½ year delay to full fecundity will be used, on the assumption that the more fecund young women are the most sexually interested; that is, that fecundity is probably higher among the sexually active.

TABLE 16: Estimated Percent of Women Fully Fecund at a Given Age or Earlier, Assuming an Observed Mean Age at Menarche of 13.54 in 1940 and a Decline to 12.54 in 1968, by Length of Period of Adolescent Sterility.

Age at Menarche	Number of Cases Observed (Mean Age = 12.54)	Percent Fully Fecund if Period of Adolescent Sterility is:			
		2.5 Years		3 Years	
		1940	1968	1940	1968
8.5	4	0	0	0	0
9	5	0	0	0	0
9.5	18	0	0	0	0
10	49	0	0	0	0
10.5	104	0	0	0	0
11	198	0	0.1	0	0
11.5	368	0	0.3	0	0.1
12	526	0.1	1	0	0.3
12.5	629	0.3	3	0.1	1
13	561	1	6	0.3	3
13.5	422	3	13	1	6
14	189	6	23	3	13
14.5	107	13	37	6	23
15	55	23	54	13	37
15.5	25	37	69	23	54
16	17	54	80	37	69
16.5	4	69	88	54	80
17	0	80	93	69	88
17.5	0	88	94	80	93
18	0	93	95	88	94
18.5	0	94	95	93	95
19.5	0	95	--	95	--
20	0	95	--	95	--
Total	3,281				

Source: Cutright, 1972a, Table 2, page 26.

3. The Proportion Who Are Sexually Active: SA

Despite the direct association between sexual activity and childbearing, very little is known about the incidence, age of onset, timing, frequency, and characteristics of partners involved in nonmarital intercourse. The best source of data is the 1971 national probability sample of women aged 15 to 19 conducted by Kantner and Zelnik of Johns Hopkins University. Their data indicate that premarital sexual activity is quite common, especially among black youth, and that the incidence increases steadily with age.[50/] Table 17 reports the proportion of young women who have ever had intercourse, by age and race.

TABLE 17: Percent of Unmarried Women Aged 15-19 in 1971 Who Have Ever Had Intercourse, by Age and Race

Age	Black	White	Total
15	32%	11%	14
16	46	18	21
17	57	22	27
18	60	34	37
19	81	40	47
15-19	54	23	28

Source: Zelnik and Kantner, 1972, p. 360.

More important to the likelihood of conception, however, is the frequency of intercourse. Table 18 reports the proportion of young women who have ever had sexual intercourse, who actually had intercourse during the last month, by age, race, and frequency of intercourse during the month. Clearly, at most ages the modal frequency is zero. Despite the fact that most young women are not engaging in sexual intercourse in any given month, it is important to note the high proportion who are. Table 19, based on Tables 17 and 18, reports the proportion of women, by age and race, who indicated that they had had intercourse at least once during the month prior to the interview.

TABLE 18: Percent Distribution of Frequency of Intercourse in "Last Month", by Age and Race[a]

Age	Frequency in last month									
	None		1-2		3-5		6 or more		Total	
	Black	White	Black	White	Black	White	Black	White	Black	White
15	45.3	49.6	34.4	27.4	14.6	13.3	5.7	9.7	100.0	100.0
16	46.4	45.2	30.4	37.1	16.2	2.6	7.0	4.1	100.0	100.0
17	38.6	32.1	40.2	35.4	15.7	18.0	5.5	14.5	100.0	100.0
18	44.6	35.0	33.8	24.9	13.2	21.4	8.4	18.7	100.0	100.0
19	33.6	33.8	25.1	23.1	31.1	18.9	10.2	24.2	100.0	100.0
Total	41.0	37.3	32.6	28.6	18.8	18.0	7.6	16.1	100.0	100.0

[a]Percentages computed omitting those who gave no answer to the question; this amounted to 7.8 percent of the blacks and 6.3 percent of the whites.

Source: Zelnik and Kantner, 1972, p. 364.

TABLE 19: Proportion of Females 15-19 Reporting They Had Intercourse in "Last Month" By Age and Race

Age	Black	White
15	18%	6%
16	25	10
17	35	15
18	33	22
19	53	26

Source: Derived from data in Tables 17 and 18 .

The data presented in Table 19 provide the best estimate of premarital sexual activity, but may nevertheless understate the level of sexual activity in the second half of the seventies decade, because the data are four years old and a rapid expansion of sexual permissiveness seems to be under way. Zelnik and Kantner's data illustrate the trend. In Table 20, one can observe

TABLE 20: Percent That Had First Intercourse at Each Age, by Current Age and Race

Age at first intercourse	Current age									
	15		16		17		18		19	
	Black	White	Black	White	Black	White	Black	White	Black	White
<12	17.3	8.0	3.0	5.5	5.0	1.1	3.3	6.0	0.9	1.4
13	14.2	17.5	6.0	3.7	4.6	1.3	3.7	4.3	2.6	1.2
14	34.7	30.8	21.8	10.4	7.2	6.9	6.6	2.8	4.2	0.6
15	33.8	43.7	31.9	29.8	30.3	14.4	10.8	6.8	8.2	1.3
16	...	...	37.3	50.6	36.9	51.4	29.5	16.6	25.0	11.7
17	...	...	...	...	16.0	24.9	32.8	30.3	34.0	23.7
18	...	...	...	...	...	...	13.3	33.2	23.3	35.7
19	...	...	...	...	...	...	...	...	1.8	24.4
Total[a]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[a]Base excludes 3.7 percent of the blacks and 2.8 percent of the whites for whom information on age of first intercourse was not available.

Source: Zelnik and Kantner, 1972, p. 364.

that the proportion of women ever having intercourse by age 14, for example, is much higher among the younger females than among those aged 18 or 19 at the time of the interview. Even allowing for memory lapses over time among the older girls, it seems that over just a four-year period more girls had come to initiate their sexual experience at an early age.

Cutright does not feel that the steady increase in o-w childbearing since 1940 is due to increased sexual activity but to greater fecundity and fewer spontaneous abortions, changes that are due to improved health and nutrition during prepadolescent years.[51/] He maintains that no improvement in contraceptive technology reached the unmarried population until at least 1968; thus he rules out the one factor that would prevent an increase in sexual activity from having a direct association with the increase in o-w births. As he notes, a decline in the age at menarche would mainly affect the fertility of girls who are 15, 16, and 17. (In 1940, 93 percent of the 18 year-old females were fecund, so the rise to 95 percent in 1968 had little effect on the fertility of this age group.) It

will be noted from Tables 4 and 5, however, that o-w fertility rates increased among all age groups between 1940 and the late sixties, not just among the young, newly fecund age group (a point which Cutright acknowledges elsewhere).[52/] Therefore a change in the age of menarche cannot be a complete explanation. And there are a number of bits and pieces of evidence -- besides the Zelnik/Kantner data and in addition to the increasing liberality in advertising, literature, dress, and entertainment that are so readily apparent -- that indicate that nonmarital sexual activity is on the increase.

A national poll on sexual attitudes and experience, appropriately commissioned by the Playboy Foundation, suggests that an increase has occurred in the proportion of persons who engage in premarital intercourse, especially among females. As Table 21 shows, only 31 percent of women over age 55 reported premarital intercourse, while 81 percent of the youngest age group did. Other data from this study indicate that by age 17, a third of the single white females had had premarital intercourse, a proportion that rose to 75 percent by age 25. The estimate for seventeen-year-olds is a bit higher than the Zelnik and Kantner figure, but either figure represents a rather dramatic increase in sexual activity among young people. For example, Kinsey's interviews between 1938 and 1949 produced the following data: by age 15, 3 percent of single white females had ever had intercourse; by age 17, about 10 percent had; by age 19, the proportion rose to 18-19 percent; by age 25, a third had had premarital intercourse.

TABLE 21: Percent Ever Having Premarital Coitus: Total Married Sample, by Age and Sex

	18-24	25-34	35-44	45-54	55+
Male.....	95	92	86	89	84
Female.....	81	65	41	36	31

Source: M. Hunt, Sexual Behavior in the 1970s, 1974.

Along with a change in behavior, a change in attitudes regarding allowable sexual activity seems to have occurred, and these data suggest that the change has really been fairly recent. For example, Roper polls in 1937 and 1959 found no significant change between these two dates (see Table 22),

TABLE 22: Opinions of Roper Poll Respondents on the Question "Do You Think It is All Right for Either or Both Parties to a Marriage to Have Had Previous Sexual Intercourse?" 1937-59

	1937	1959
All right for both	22	22
All right for men only	8	0
All right for neither	56	54
Don't know or refused to answer	14	16

Source: M. Hunt, Sexual Behavior in the 1970s, 1974, Table 12.

Several studies of the attitudes of college students during that same time period also indicate a rather low level of acceptance of premarital sexual relations (see Table 23).

TABLE 23: Percentage of Students Checking Each of Four Statements Representing Attitudes on Premarital Sex Standards

APPROVED STANDARD	11 COLLEGES 1952-1955 (N = 3000)	MICHIGAN STATE U 1947 (N = 2000)	CORNELL 1940 (N = 175)
		Males	
SEXUAL RELATIONS			
For both	20	16	15
None for either	52	59	49
For men only	12	10	23
Between engaged only	16	15	11
		Females	
For both	5	2	6
None for either	65	76	76
For men only	23	15	11
Between engaged only	7	7	6

Source: I. Reiss, The Social Context of Premarital Sexual Permissiveness, 1967, Table 22.

During the last several years, however, opinions seem to have changed a great deal. A question posed in the Playboy study on the acceptability of premarital intercourse documents a radical shift in opinions, especially among the youngest respondents and among women (see Table 24). It is interesting to

TABLE 24: Percent of Respondents Agreeing that Premarital Coitus Is Acceptable, by Age of Respondent

	Males		Females	
	18–24	55 and over	18–24	55 and over
For a man:				
—where strong affection exists	86	57	73	32
For a woman:				
—where strong affection exists	80	48	59	11

Source: M. Hunt, Sexual Behavior in the 1970s, 1974, Table 14.

note that a double standard still exists, and that it is stronger among females than among males. The double standard can be noted in earlier surveys as well. It is more germane to note, however, that college students several decades ago show a much lower level of approval of premarital relations than do survey respondents of the same age today.

It is unfortunate that data on the sexual experience of Americans are so limited and so subject to bias. Neither the Kinsey study nor the college student studies can be argued to accurately represent the attitudes and behavior of all Americans, and it is therefore not possible to conclude definitively that changes in the age and frequency of sexual experience have occurred. The classic Kinsey study has been criticized for not being representative of the typical person, the assumption being that people who were willing to discuss their sex lives freely were probably more liberal and sexually active than the "average" person. If the early data are biased in this way, however, then the degree of change may actually be underestimated. But because no certain baseline can be

established, the proportion of the increase in o-w childbearing that can be attributed to an increase in sexual activity cannot be pinpointed. It does seem reasonable to conclude that change of an important if not quantifiable magnitude has occurred, such that the proportion of females who have ever had intercourse by a given age has increased and that attitudes have become fairly accepting of such behavior. It is also safe to conclude that an increase in sexual behavior, other factors being equal, will result in an increased number of conceptions.

The data from the Zelnik/Kantner study, presented in Tables 17-19, will be used as estimates of the sexual activity of young people, with the caveat that if the trend toward earlier sexual experience has continued, the data may understate the level of sexual activity somewhat. For women aged 20 and up, it will be necessary to extrapolate the age trends or develop estimates from other currently unknown sources. Given the importance of knowledge about sexual functioning to issues concerning fertility, the spread of venereal disease, the use of abortion, and the well-being of individuals both in and out of marriage, it is truly surprising and unfortunate that data do not exist to fill the gaps in current knowledge.

C. The Proportion Who Conceive: $(P_{nx}P_{c/nx} + P_{x}P_{c/x})$

Advances in contraceptive technology during the past several decades have provided couples who are interested in preventing or postponing births with highly efficient, convenient, and inoffensive methods. The pill and the IUD, if used correctly, are approximately 99 percent effective. In addition, they are clean, inconspicuous, and are used separately from the sexual act so that usage does not interfere with spontaneity in lovemaking. Despite the recency of their introduction, public awareness of these methods is widespread. For example, in their national probability sample of women aged 15-19, Kantner and Zelnik found that nearly all of the young women interviewed had at least heard of birth control pills, regardless of whether they were personally sexually active.

Although fewer than half of the young women who had not had intercourse had heard of the IUD (see Table 25), approximately two-thirds of the sexually active young women had heard of the IUD. Clearly, awareness that there are ways to prevent pregnancy is nearly universal.

TABLE 25: Percent of Young Women 15-19 Who Have Heard of a Method of Contraception, by Race and Intercourse Status, 1971

Method	Has had intercourse		Has not had intercourse	
	Black	White	Black	White
Birth control pills	97.0	99.8	94.8	93.5
Foam, jelly, or cream . . .	72.5	84.6	56.4	57.3
IUD, "coil", or "loop" . . .	60.4	66.1	37.7	45.0
Diaphragm	64.6	83.6	51.3	56.5
Rubber or condom	90.7	95.7	78.4	83.7
Douche or "washing oneself out"	89.2	90.4	77.4	74.5
"Safe period" or rhythm	54.6	64.8	45.4	69.2
Male withdrawal or "pulling out"	73.1	93.1	51.5	62.0

[a]Base includes those for whom no answer was obtained on specified method.

Source: Zelnik and Kantner, 1972, Table 5.

Table 26 presents data on the type of contraceptives used "most recently" by young women interviewed in the Kantner and Zelnick study. About half of

TABLE 26: Method of Contraception Used Most Recently by Females Aged 15-19, by Race and Age

Method Most Recently Used	15		16		17		18		19		15-19		
	Black (N=104)	White (N=68)	Black (N=144)	White (N=109)	Black (N=174)	White (N=137)	Black (N=157)	White (N=155)	Black (N=123)	White (N=148)	Black (N=702)	White (N=617)	Total (N=1,319)
Pill	6.9	1.5	22.9	7.0	18.7	18.7	28.2	22.5	29.7	36.8	22.5	21.0	21.4
Condom	39.6	23.0	35.8	41.4	36.3	25.1	32.0	20.7	34.9	18.3	35.4	24.5	27.3
Withdrawal	14.5	36.3	4.8	21.9	12.6	37.6	10.0	31.9	5.6	23.6	9.2	29.5	24.1
IUD	2.1	0.0	0.5	0.0	3.1	0.0	4.2	1.1	4.3	0.8	3.0	0.5	1.2
Douche	5.6	2.8	12.0	3.6	15.8	1.1	7.0	3.5	9.2	1.3	10.2	2.4	4.5
Other*	3.3	1.3	1.9	6.2	2.9	4.8	7.9	7.0	5.3	7.0	4.4	5.9	5.5
Never Used	28.0	35.1	22.1	19.9	10.6	12.7	10.7	13.3	11.0	12.2	15.3	16.2	16.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

* Foam, jelly, cream, diaphragm and rhythm.

See also note to Table 1.

Source: Kantner and Zelnik, 1973, Table 7.

the young women used quite effective methods of contraception -- the pill, condom, and the IUD. The other one-half relied on extremely ineffective methods of contraception, or no method at all. In addition, these reports are for the contraceptive used "most recently" and as we note in Table 27, fewer than one-half of the women actually used their method of contraception the last time they had intercourse.

Given the widespread awareness of at least one highly reliable method of contraception among young women, it seems somewhat surprising at first that the frequency of contraceptive use is so low. Other data gathered by Kantner and Zelnik indicate that young women typically do not use contraception. Overall, only 43 percent of their black respondents and 49 percent of the white respondents reported using contraception the last time that they had intercourse. The use of contraception increases with age, but, as illustrated in Table 26, at most only about a quarter of the girls at any age report that they have consistently used a method of contraception. The majority describe themselves as "sometimes" using contraception.

TABLE 27: Percent of Sexually Experienced Never-Married Women Aged 15-19, According to Contraceptive Use Status*, by Age and Race

Age	Black (N=712)				White (N=630)				Total (N=1,342)			
	Never	Some-times	Al-ways	Last Time	Never	Some-times	Al-ways	Last Time	Never	Some-times	Al-ways	Last Time
15	27.3	49.5	19.6	28.9	34.1	44.3	18.8	29.0	31.9	46.0	19.0	29.0
16	21.4	59.6	15.2	34.8	19.5	56.5	21.9	39.0	20.1	57.4	20.0	37.8
17	10.6	69.2	19.5	44.1	12.4	68.7	15.7	44.6	11.9	68.9	16.9	44.5
18	10.6	72.9	15.4	49.3	13.1	67.9	17.7	51.4	12.6	69.0	17.2	50.9
19	10.6	77.7	7.1	49.8	12.0	59.1	26.4	61.7	11.7	63.7	21.6	58.8
15-19	14.9	67.5	14.8	42.8	16.0	61.3	20.5	48.5	15.7	62.9	19.0	47.0

*Note: Base includes those who gave no answer to the question.

Source: Kantner and Zelnik, 1973, Table 1.

Given the infrequent and inconsistent use of contraception among the sexually active, it would seem that the probability of conception is quite high. The o-w accounting model incorporates two terms that represent this probability. One, $\left(P_{nx} \cdot P_{c/nx}\right)$, represents the proportion not using contraception times the proportion that can be expected to conceive given non-use; it yields the rate of conceptions per 100 sexually active females who are not using birth control. The second term, $\left(P_{x} \cdot P_{c/x}\right)$, represents the proportion using contraception times the proportion that become pregnant although they are using contraception; it yields the rate of conceptions per 100 sexually active women who are using contraception at least some of the time.

Unfortunately, estimation of these terms is extremely difficult and requires more detailed information than is currently available. It is one thing to state that over the long run, 80 percent of all women exposed to intercourse without contraception will become pregnant[53] or to calculate that the overall chance of becoming pregnant upon a single act of unprotected intercourse is 4 percent.[54] It is quite another to state what the odds of pregnancy are for a young unmarried woman of unknown fecundity, who has intercourse irregularly and who contracepts erratically. In order to produce a good estimate, one would need data on frequency of intercourse, type of contraceptive used, regularity of use, and correctness of use. These data are not currently available for the unmarried population. It is possible that an estimate could be produced from the survey data gathered by Kantner and Zelnik; but they have published little on the question aside from the data presented in Tables 25 and 26. On the basis of the data that they have released to The Urban Institute, one finds that the proportion who become pregnant is 6 percent among women who always use contraception, 40 percent among women who sometimes

use contraception, but only 27 percent among women who have never used contraception! Presumably, the "never" category includes disproportionate numbers of those who have only recently begun having intercourse. It is hoped that a better estimate of the probability of conception dependent upon contraceptive use can be developed.

Given recent improvements in contraceptive technology and the wider availability of knowledge and services related to birth control, one would think that the use of contraception would be an important factor in holding down o-w fertility, as well as marital fertility. Presumably, the use of contraception has been important in the declining incidence of o-w pregnancy among older women. Why do young women have such difficulty in translating their awareness of birth control into use of birth control?

One reason for the failure to use contraception regularly and correctly may be the lack and/or incorrectness of information that young people have regarding conception and contraception. Data from the Kantner and Zelnik study suggest that young women do not correctly perceive the likelihood of their becoming pregnant. Twenty-eight percent of white and 55 percent of black young women who have ever had sexual intercourse think that pregnancy will not occur "easily" even when they are not using contraception.[55/] This belief may be a result of the fact that the onset of menstruation generally does not represent the onset of fecundity, so that young women may engage in sexual activity for several years without really being in danger of becoming pregnant, even though they have had their first menstruation. During this time, they may lose their fear of becoming pregnant, or never develop a concern that they might become pregnant, until they finally do become fecund... and pregnant.

Young women in this same study were also found to be poorly informed as to the time in their menstrual cycle when conception is most likely. Only 42 percent of the whites and 18 percent of the blacks were generally correct about the time of greatest fecundity.[56] These researchers found half the black women in their sample considered the time before, during, and after menstruation as the time when they were most likely to get pregnant, which, as the authors note, is a highly dangerous notion. The degree of misinformation was not reduced among older or sexually experienced blacks, although older and more experienced whites were more knowledgeable. As Table 28 indicates, the educational attainment of the young woman's mother is related to correctly reporting that "about two weeks after a period begins" is the time of the greatest pregnancy risk.

TABLE 28: Percent of Unmarried Young Women Aged 15–19 Who Correctly Perceive the Time of Greatest Risk within the Menstrual Cycle, for Single Years of Age, by Race and Education of Female Parent or Guardian

Age	Black			White			Total		
	Elementary	High School	College	Elementary	High School	College	Elementary	High School	College
15	11.2	18.9	24.2	24.1	29.9	40.4	21.7	28.4	39.0
16	14.5	16.8	29.0	28.8	38.0	47.8	26.2	35.4	46.6
17	21.1	15.1	28.5	34.1	39.2	61.1	31.3	35.9	58.9
18	14.0	15.5	21.6	37.9	55.6	64.0	32.2	50.5	61.1
19	19.5	23.8	*	40.9	56.5	66.4	36.2	51.4	65.9
15-19	16.1	18.4	27.3	32.6	42.3	56.0	29.2	39.0	54.1

* Unweighted N = <20.

Source: Kantner and Zelnik, 1972b, Table 13.

The failure to use contraception is often held to be the result of more than simply a lack of correct information. It has been frequently assumed that the failure to use contraception is either deliberate or the manifestation of a psychological need or personality problem. A variety of conscious and rational reasons can be outlined for wanting to become pregnant, even out of wedlock.

Becoming pregnant in order to force marriage is a long-recognized motive for pregnancy, both on the part of a female who wants a male to marry her and on the part of a couple who want to force parents to accept their marriage plans. This may be a fairly effective technique for white girls especially, since, as one study found, 72% of all premaritally pregnant white females aged 15-19 married before the birth of their child. Only 32% of black females married before their child was born, however.[57/]

Another motivation for pregnancy on the part of unmarried women is to provide themselves with a source of love. Perhaps unrealistically evaluating the demands and difficulties posed by a young child, these "little mothers," as Connolly[58/] (1975) calls them, see pregnancy as a solution for loneliness and a lack of love. She quotes from an interview with one young mother of two boys, Dougie and Richard, who is looking back on her own motivations:

> I knew that my parents could have a marriage annuled, but that they couldn't annul a baby...I wanted a baby that was my very own. I knew that a baby was something that no one would be able to take away from me, or tell me what to do. I guess I was too young, being 13 and all...maybe being romantic...Maybe I just wanted a plaything... I really wanted Dougie.

It is clear from this quote that this mother, a thirteen-year-old unmarried girl at the time of her first pregnancy, <u>wanted</u> her first child. It is not

clear that the child has provided her with the gratifications that she anticipated, but that discovery inevitably comes too late. Connolly reports that it is the consensus of the social workers who deal with these "little mothers" that the girls come either from homes where they are mistreated or unhappy or else from foster homes. To them, setting up their own household supported by welfare seems like an improvement in the quality of their lives.

Having her own household, even if it is supported by welfare, provides the young woman with a degree of independence and autonomy. In addition, a mother with her own household is, in the eyes of most people, an adult, even if she cannot vote, lacks a high school diploma,and cannot support herself. The desire for an adult identity, as noted by Hoffman and Hoffman,[59] can be a motivation for pregnancy among young women.

> More than finishing school, going to work, or even getting married, parenthood establishes a person as a truly mature, stable, and acceptable member of the community and provides him [or her] with access to other institutions of adult society. This is especially true for women, for whom motherhood is also defined as their major role in life. It is not only that the mass media present all 'adjusted' adult women as mothers, or that popular opinion stresses this view, but also that in the United States as elsewhere not many acceptable alternative roles are available especially for lower-class uneducated women.

It goes virtually without saying that motherhood does not necessarily reflect maturity or personal stability; but it often does encourage this kind of image. The extent to which this kind of incentive actually motivates pregnancies is unknown.

Hoffman and Hoffman[60] have outlined a variety of motivations or values that can motivate pregnancy. These include:

1. Adult status and social identity
2. Expansion of the self, tie to a larger entity, "immortality"
3. Morality; religion, altruism; good of the group; norms regarding sexuality, impulsivity

4. Primary group ties, affiliation [affection, friendship, companionship]
5. Stimulation, novelty, fun
6. Creativity, accomplishment, competence [resulting both from having and from rearing a child]
7. Power, influence, effectance [children both as a power resource and as beings over whom one has power; also, a way to have some sort of impact on the world]
8. Social comparison, competition
9. Economic utility

Since these motivations generally refer to reasons why people want to have children, they imply intention and conscious planning. It is clear that many pregnancies are truly accidents, especially in the population of young unmarried girls who have no real understanding of the likelihood of their conceiving; however, given the number of women who conceive and then do not abort--although it is now legal to do so and much cheaper than bearing a child--it is possible that many early o-w conceptions are deliberate and desired. The alienated, lonely teenager who seeks something to call her own is seeking affiliation and primary group ties. Having a child in order to obtain welfare benefits--although a far cry from the economic utility that children have traditionally provided on a family farm--nevertheless represents an example of the economic utility of bearing a child. In addition, a girl who is not doing well in school and who does not qualify for interesting or well-paying employment may find that bearing a child provides her with a feeling of creativity or accomplishment that is not elsewhere available. And it is possible that some young women derive competitive satisfaction from pregnancy as proof of their fecundity and of their sexual desirability. Thus the possibility that o-w pregnancy represents very conscious and even rational planning on the part of young women should not be ignored.

A recent book by Luker strongly endorses the rationality perspective. Luker argues that unplanned pregnancy, even when it ends in abortion, should not be regarded as an irrational behavior on the part of women. She advocates

acceptance of the following two assumptions:[61]

> The first assumption is that risk-taking behavior which ends in an unwanted pregnancy is the result of a 'rational' decision-making chain produced by a person who is acting in what he or she perceives to be his or her best interests, although often in the presence of faulty data. The second assumption is that risk-taking behavior regarding contraception is only one of a variety of similar risk-taking behaviors that ordinary people engage in.

Luker makes note of a variety of costs of contraception and benefits of pregnancy that are often ignored. Contraceptive "costs" include the loss of status and reputation attendant upon being "ready" for sex; the embarrassment of acquiring contraceptives; male dislike of some methods; worry about physical harm to the woman from a method; and the monetary cost of acquiring and using contraceptives over a long period of time. In addition, there are advantages from pregnancy: for example, being assured that one is fertile; hurting or obtaining attention from others, such as parents; evaluating the commitment of the male partner; and finding excitement in taking chances.

Viewing the use of contraception from the perspective that Luker proposes, the non-use of contraception seems more understandable. The occasional act of "taking a chance" seems especially understandable, given the typical lack of awareness on the part of couples of the high probability of pregnancy attendant upon unprotected intercourse. Luker also points out the poor bargaining position of women in an era when they are expected by males to be sexually liberated, when sex is no longer a scarce resource that can be traded for marriage, and when women are more dependent on the social and economic benefits of marriage than are men. In addition, since the most reliable contraceptives are female-oriented (pill and IUD), many men do not feel as responsible for contraception; they expect women to shoulder the burden (young males rarely use condoms);

and are often not particularly patient or cooperative with a woman who is ambivalent or reluctant to use female methods. These factors undermine women's success as contraceptors. Several quotes from interviews with abortion patients illustrate Luker's argument:

> "Before, I was always paranoid about getting pregnant. I'd always make sure the person was wearing a rubber or some kind of protection. I was so careful before I went overboard. Guys used to think, 'You're so weird, you're so careful.'"
>
> "I thought about it a lot. I thought without some kind of contraception I was bound to get pregnant. I knew I was going to, but I didn't know when or how. I still don't know when...I suppose I thought if I told him no, he would leave."

The costs associated with continuous contraception can be quite high. Thus, in addition to the ignorance/accident explanation and the deliberately planned perspective, one must consider the rational cost/benefit point of view. Yet another school of thought argues that conception manifests a personality problem or unconscious motivation. Unfortunately, although explorations of personality or psychological differences between women who become pregnant outside of marriage and women who do not have been conducted frequently over the years, they provide examples of poor research design and overgeneralized conclusions. For example, Clothier concluded in 1943 on the basis of clinical observation that pregnancy is the result of unconscious conflicts. She commented on the "role of three important and very common adolescent fantasies (rape, prostitution, and immaculate conception)" in producing o-w births.[62]

A selection from research employing a psychoanalytic approach is also interesting: "The unwed neurotically seeks from the alleged father gratifications desired but not received from love objects within the family group. She

becomes pregnant in a desperate attempt to satisfy oral dependency needs. She usually is not seeking erotic gratification. She is searching for nurturance from a mother figure symbolized in the sexual act as a forbidden kind of eroticized nurturing provided by the alleged father...."[63]

Other, more experimentally-controlled work has compared personality scores of women who are pregnant out of wedlock with married women's scores and found that the unmarried are more poorly adjusted. Unfortunately, the researchers often do not consider the possibility that women who are pregnant with an o-w child are under considerable real strain.[64] Clearly feelings of anxiety, loneliness, desertion, insecurity, etc., may be a product of the circumstances of the pregnancy.

Pauker's work provides one example of a well-designed study on personality differences between pregnant and non-pregnant teenagers. He obtained test data for girls on the Minnesota Multiphasic Personality Inventory, a psychological test taken by virtually all Minnesota school children in the ninth grade. This enabled him to compare the pre-pregnancy personality traits of girls who later became premaritally pregnant with those of girls who did not. 117 girls who became pregnant were matched with 117 girls who did not. On most of the personality scales he found no group differences, and several of the differences that he did find were "in favor of" the pregnant group. That is, the girls who became pregnant scored as slightly more energetic, less bound by custom, and more outgoing or socially active. These girls were, however, also slightly less bright as a group. The personality differences that were discovered were not consistent in all sub-groups, however, and Pauker concluded that, "These two groups of girls are much more similar than they are different. Even where the differences are statistically significant, the groups overlap tremendously; and one would be hard put to take individual matched pairs of girls and choose which one would become pregnant out of wedlock."[65]

A developmental psychologist, Sherry Hatcher, has viewed the question of individual differences in o-w conception from a new perspective.[66] She divides adolescence into three stages: early, middle, and late. These stages are not necessarily correlated with chronological age, but are characterized by distinct cognitive patterns as revealed during a long clinically-oriented interview. As her hypotheses predict, motivation for pregnancy and response to pregnancy differ among the girls in her study according to their developmental stage. The early adolescent lacks knowledge about conception and contraception and engages in extensive denial and distortion; for example, she denies her responsibility for the pregnancy. She cannot see herself as a mother, being very tied still to her own mother, nor does she have an image of the fetus as a baby. Her behavior is not particularly realistic or adaptive. She wants an abortion for herself, but does not see that others might similarly deserve to have abortions.

The middle adolescent "appears to have sufficient understanding of conception and contraception to avoid becoming pregnant. However, she eschews all opportunities to protect herself and invariably blames someone else for her plight. Authority figures are the usual target, more specifically a father figure: her doctor, her boyfriend, or even her father himself." She feels more guilt than the early adolescent, but it is externalized. Thus she sees abortion as forced by someone else.

The late adolescent typically has the knowledge to prevent conception, and when she slips up, unconsciously or consciously, she accepts the blame. She is not shocked to learn that she is pregnant and sees the fetus, and motherhood as well, fairly realistically. The most frequent motivation for pregnancy among Hatcher's subjects at this stage was to consolidate a relationship or force a marriage.

Hatcher's study is based on too small a sample to be considered conclusive. However, her work serves to alert researchers to a factor in affecting o-w conception that has not hitherto been considered -- the developmental maturity of the parent.

The factors that motivate an o-w pregnancy and the psychological factors affecting contraceptive effectiveness constitute a fascinating and important area for further research. Clearly, even the most reliable methods of birth control will not prevent a pregnancy that is desired, for whatever reason it is desired. On the other hand, a pregnancy that is simply the unintended consequence of ignorance or of the high cost of obtaining contraceptive services might be prevented by reducing the difficulty of obtaining contraceptives or by disseminating information on the risk of conception. A count of the proportion of the sexually active who become pregnant can be made on the basis of the Kantner and Zelnik data. However, a clear picture of the motivations for conception and contraception cannot be presented at the present time. This is an important issue, deserving of further research, since once a woman is pregnant, decisions become more complicated, momentous, and expensive. A woman can still avoid bearing a child out of wedlock, however, if she aborts the fetus or marries.

D. The Number of Live Births: LB

1. Abortion - Spontaneous, Legal and Illegal: SpA, LA and IA

A rather substantial proportion of the pregnancies that are conceived out of wedlock do not terminate in a live birth. Some are legally aborted, and some are illegally aborted, while others are aborted spontaneously, that is, miscarried. Data from the Zelnik and Kantner survey indicate that at least 8 percent of pregnancies to adolescents end in miscarriage or stillbirth. (Respondents reported 48 miscarriages and 4 stillbirths out of 624 pregnancies.)

This figure is probably an underestimate, since many a miscarriage occurs before the woman even knows that she is pregnant and because deliberate underreporting almost certainly takes place. Since the facilitation of spontaneous abortion by poor nutrition or health care is in no way an acceptable policy option, this source of fetal loss will not be discussed. If a woman is pregnant and wishes to bear the child, it is in the interest of everyone to see to it that she has adequate prenatal care so that both child and mother can be healthy and so that the child does not suffer a loss of intelligence or vitality. In the case of a pregnant unmarried woman who does not wish to continue her pregnancy, however, the availability of abortion services is a critical factor.

In 1973, decisions of the United States Supreme Court made abortion legal in all of the states. The principal effect of this ruling, at least for the short run, was probably to substitute legal abortions for abortions that would have taken place illegally. Tietze calculates that of the legal abortions obtained in New York City between July 1, 1970, and June 30, 1972 by resident women, 70 percent were simply substitutions for illegal abortions that would have taken place anyhow. The remaining 30 percent, however, were considered to be responsible for approximately half of the decline in the number of births during that time period.[67/]

The United States Center for Disease Control (CDC) maintains records on the number of legal abortions that occur annually, but reporting by states to the Center is admittedly incomplete: "These (Supreme Court) decisions resulted in the establishment of abortion services in many states in which very few abortions had been done previously. In most of these states the central health agency did not have a reporting system for collecting data on abortions performed in 1973. Therefore, 1973 data were obtained by contacting individual hospitals and facilities in the 26 states which had no reporting systems."[68/]

The CDC estimates reached in this manner are about 20 percent lower than the estimates obtained in the nationwide survey of 1,642 doctors, hospitals and clinics conducted by the Alan Guttmacher Institute (the Research and Development Division of Planned Parenthood Federation of America).[69/] These data on the incidence of abortion presented in Table 29 probably represent an underestimate, since they constitute only those abortions that are legal and that are reported.

TABLE 29: Total Number of Legal Abortions in the United States, by Year

	United States Center for Disease Control Estimates	Planned Parenthood Federation Estimates
1975	--	998,020+
1974	763,476	889,850
1973	615,831	745,440
1972	586,760	*
1971	480,259	*

\+ 1975 projection based on reported data for the last three quarters of 1974 and the first quarter of 1975.

* Survey did not cover years before 1973.

Sources: Alan Guttmacher Institute, "Provisional Estimates of Abortion Need and Services in the Year Following the 1973 Supreme Court Decisions," Table F. Center for Disease Control, "Abortion Surveillance" - Annual Summaries for 1971, 1972, 1973 and 1974. E. Weinstock et al., "Abortion Need and Services in the United States, 1974-75" Family Planning Perspectives, Vol. 8, No. 2 (March/April 1976), p. 59.

According to CDC data based on 33 reporting states, nearly a third of the reported abortions in 1974 were obtained by women under the age of 20 (see Table 30 for 1974 data), and approximately 7 in 10 were obtained by women who were not currently married. These statistics suggest that the availability of abortion

is an important influence on the incidence of out-of-wedlock childbearing. Other work on the subject supports this conclusion.

TABLE 30: Legal Abortions in the United States in 1974, by Age of Woman

Age	Number of Abortions*	Percent	Ratio**
15	8,630	1.5	1156
15-19	177,196	30.9	491
20-24	180,735	31.5	263
25-29	102,917	17.9	184
30-34	57,046	9.9	244
35-39	30,689	5.3	389
40	11,873	2.1	585
Unknown	5,073	0.9	--
Total	574,159	100.0	292

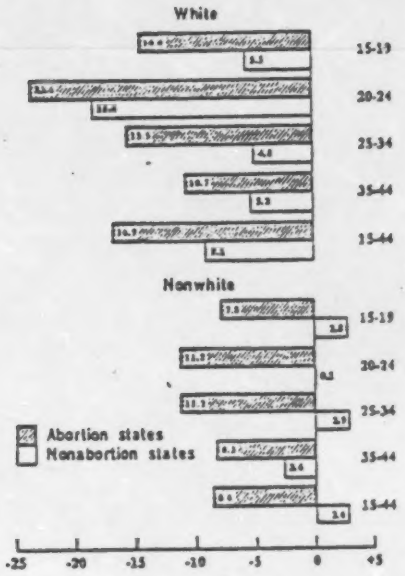
* All states with data available are included.

** Abortions per 1000 live births to women of that age group; data for states with age unknown for more than 15% of cases were excluded.

Source: Center for Disease Control, Abortion Surveillance - Annual Summary.

Data presented by Sklaar and Berkov indicate that the main impact of legalized abortion has been on the incidence of out-of-wedlock fertility rather than on marital fertility.[70/] Figure 3, prepared by Sklaar and Berkov, illustrates the impact of legal abortion on the incidence of o-w childbearing in states that liberalized their abortion laws. In states where early legalization occurred, o-w birth rates declined 12 percent between 1970 and 1971, compared to a 2 percent decline in the remaining states. The decline in abortion states exceeded the decline in non-abortion states for every age and race group. Indeed, states not legalizing abortion experienced a slight rise in the incidence of o-w childbearing among four of the five nonwhite age groups.

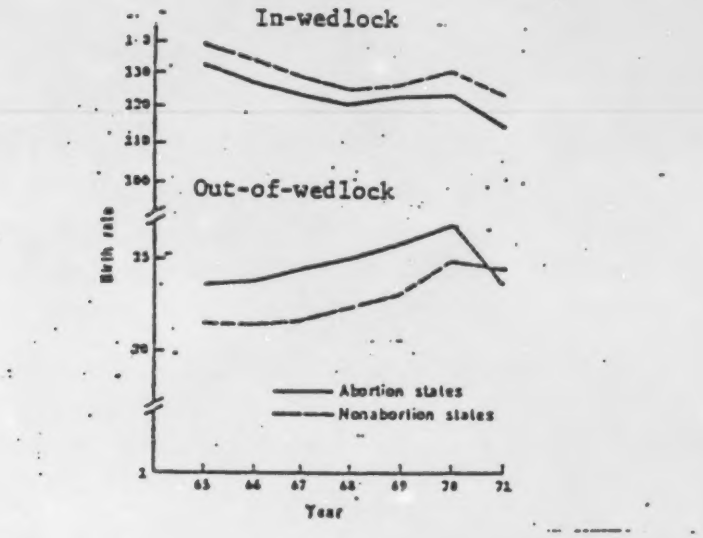
FIGURE 3: Percent Change in Out-of-Wedlock Birth Rates, by Age and Race, in States Having or Not Having Early Legalization of Abortion, 1970 - 1971



Source: Sklaar and Berkov, 1974, Figure 1.

Figure 4 illustrates the overall trends in fertility rates between 1965 and 1971. It is interesting to note that the states legalizing abortion at an early date had, with only one exception, lower fertility within marriage but higher fertility outside marriage. In both sets of states, legitimate birth rates were falling gradually, with abortion states registering a relatively steep decline about 1970. Out-of-wedlock fertility rates were drifting upward, on the other hand, finally levelling off in non-abortion states while dropping dramatically in abortion states.

FIGURE 4: Birth Rates by Legitimacy Status of Birth and State Abortion Law, 1965 - 1971



Source: Sklaar and Berkov, 1974, Figure 2.

Interviewing for the study of teenage fertility conducted by Zelnik and Kantner took place in 1971, before the Supreme Court ruling struck down restrictive state laws on abortion. Although those data cannot, therefore, provide an estimate of the current use of abortion among women pregnant out of wedlock, they are interesting nevertheless. The abortions reported in that study were concentrated in states where the procedure had been legalized. Of the 49 abortions reported to Zelnik and Kantner's interviewers, 22 were reported by girls living in states in which abortion was legal in 1971. That is, residents of 6 states accounted for 45 percent of the abortions that were reported. Seven additional abortions were reported by girls living very near to a state where abortion was legal. The remaining 20 abortions were reported by women living in states without legalized abortion, but, unfortunately, no information was obtained on the state in which the abortion was performed and whether or not it was legal. Not surprisingly, given the fact that abortion has typically been

illegal, data on the incidence of abortion have been rather sketchy. Now that abortion is legal and increasingly available throughout the country, the incidence of legal abortion has risen and better data on its occurrence are beginning to be available.

The legalization of abortion also affects who can and will obtain an abortion. For example, abortions now seem to be more available to blacks who desire them. Research reported by Kramer indicates that in New York City between September, 1970, and August, 1971, the abortion rate (the summation of age-specific rates of legal abortion during a one-year period over all age groups in the female population, a measure comparable to the total fertility rate) was twice as high among blacks -- 1.80 compared to 0.89 among whites. She notes, "Prior to liberalization of New York's abortion law, the total fertility rate of blacks was 2.85, as compared to 2.15 for whites... In the course of just 18 months, the total fertility rate of blacks fell to 1.84." Commenting that the difference in the utilization of abortion does not seem to be associated with socioeconomic or demographic differences, Kramer concludes, "By enabling blacks to avert what must have been a substantial number of unwanted births, and thereby to reproduce at a rate more compatible with the well-being of the family unit, abortion legalization may rank as one of the great social equalizers of our time."[71/]

While Kramer may be overestimating the social impact of abortion, it is clear that the legalization of abortion has made the procedure much more available to poor women who have not had the means to travel out of state to obtain an abortion that many middle class women have had.

It is not terribly difficult to demonstrate that legal abortion has "an impact" on out-of-wedlock childbearing. Quantification of this impact into a measure of the number of conceptions that are aborted, by age and race, is much more difficult and requires making a number of assumptions. An estimate has been developed for black and white females aged 15 to 19 by combining data from a number of sources.

First, the Planned Parenthood figure for the total number of legal abortions occurring in 1974 -- 889,850 -- is chosen as being more accurate at this point in time than government figures. However, the statistics prepared by the United States Center for Disease Control provide the only estimates of the proportion of all abortions obtained by females of different ages. According to CDC, 31 percent of all abortions were obtained by females aged 15 to 19 in 1974, approximately 275,854 abortions.*

889,850	Total 1974 abortions (times)
x .31	Proportion of abortions obtained by females 15-19
275,854	1974 abortions (=) to females 15 - 19

Then, assuming that the proportion of white and nonwhite females seeking abortions does not vary by age, the overall CDC estimate of abortions obtained by nonwhite women -- 29 percent -- is multiplied by the teenage total to yield an estimate of the number of abortions to nonwhite teenagers. Whites are assumed, of course, to have had the remaining number of abortions.

275,854	1974 total (times)
x .29	Proportion of abortions obtained by nonwhites
79,998	1974 abortions (=) to nonwhites 15 - 19
195,856	Residual: 1974 abortions to whites 15 - 19

*Since United States abortion laws have been liberalized in recent years, the number of illegal abortions is believed to have declined greatly. Cates and Rochat estimate on the basis of the occurrence of abortion-related mortality, that only about 17,000 illegal abortions occurred in 1974. If these were distributed as legal abortions are, then blacks aged 15-19 would have had about 81,750 abortions, while whites would have had 200,150. (See Willard Cates and Roger Rochat, "Illegal Abortions in the United States: 1972-1974," Family Planning Perspectives, Vol. 8, No. 2 (March/April 1976), pp. 86-92.

By developing estimates of the total number of conceptions,* the proportion of conceptions that are aborted can be calculated for white and nonwhites:

	Whites	Nonwhites
a.) 1974 abortions to females 15-19	195,856	79,998
b.) 1974 out-of-wedlock births	85,000	125,700
c.) miscarriages	24,442	17,887
d.) legitimated live births	330,718	30,489
total estimated conceptions to unmarried females 15-19	635,996	254,074
$\frac{\text{abortions}}{\text{conceptions}}$:	$\frac{195,856}{635,996} = .308$	$\frac{79,998}{254,074} = .315$

*The estimates were obtained or developed as shown below.

a.) Total 1974 abortions = 889,850, according to the Alan Guttmacher Institute, the research wing of Planned Parenthood, New York, N. Y.

31% of abortions obtained by females 15-19 and about 29% by blacks, according to U. S. Center for Disease Control, Atlanta, Georgia.

892,380 x .31 = 275,854 abortions to females 15-19.
Then, 275,854 x .29 = 195,856 to nonwhites
and 275,854 x .71 = 79,998 to whites

b.) Center for Health Statistics, Vital Statistics Report, Advance Report - Final Natality Statistics, 1974, Vol. 24, No. 11, Supplement 2 (February 13, 1976).

c.) Using the estimate of miscarriages from page 58,

$$\frac{\text{not miscarried (births and abortions)}}{\text{not miscarried + miscarried}} : \frac{92}{100} = \frac{\text{whites } 280,856}{x} \qquad \frac{92}{100} = \frac{\text{nonwhites } 205,698}{x}$$

$x = 305,278$ $\qquad x = 223,585$

d.) Using the estimate of marriages from page 68,

$$\frac{\text{no marriage}}{\text{no marriage + marriage}} : \frac{48}{100} = \frac{\text{whites } 305,278}{x} \qquad \frac{88}{100} = \frac{\text{nonwhites } 223,585}{x}$$

$x = 635,996$ $\qquad x = 254,074$

This procedure produces an estimate of approximately 31 percent for both race groups. It is interesting that virtually the same estimate for the proportion of conceptions aborted is arrived at for both blacks and whites. Clearly, the distribution of conceptions varies a great deal in the other categories, with many more whites marrying and many more blacks bearing their children outside of marriage, but blacks and whites who are pregnant outside of marriage seem to resort to legal abortion to approximately the same degree.

E. The Number of Live Births that are Not Legitimated by Marriage: NM

One frequent escape from becoming an unwed mother is legitimation of the pregnancy by marriage. This seems to be a pattern most often followed by white females. Cutright indicates that 69-70 percent of white o-w conceptions are legitimated by marriage, as are 35-46 percent of black o-w conceptions.[72/] His calculations, reported in Table 31, represent only the ratio of births occurring during the first 8 months of marriage (pre-marital pregnancies or "PMP") to the sum of PMP + O-W (out-of-wedlock births), $\frac{PMP}{PMP+O-W}$, derived from the 1964-66 National Natality Survey. As such, abortions and miscarriages are not considered. More detailed and up-to-date data are available from the Kantner and Zelnik survey.

TABLE 31: Percent of First Births Conceived Out of Wedlock Legitimated by Marriage, by Age and Race of Mother

Age of Mother	White	Non-White
15-19	72%	32%
20-24	66	48
25-29	54	0

Source: Cutright, 1972, p. 406.

Their data indicate a lower proportion marrying when all who conceive are considered. They do replicate the lower frequency of legitimation among blacks though (see Table 32).

TABLE 32: Percent Distribution of Women 15-19 Having a Premarital Pregnancy, by Marital Status or Marriage Plans

	White	Black
Number of girls premaritally pregnant	186	336
Percent married before outcome of pregnancy	50	8
Percent married after outcome of pregnancy	11	6
Percent currently pregnant and not married	8	14
Percent of the currently pregnant who plan to marry before baby is born	20	25
Percent of ever premaritally pregnant ever married or having marriage plans	62%	18%
Percent of ever premaritally pregnant married before outcome or planning to marry before outcome (legitimated pregnancies)	52%	12%

Source: Zelnik and Kantner, 1974, pp. 77-78.

Ross and Sawhill have suggested a possible explanation for the lower frequency of legitimation among blacks, noting that it "may simply reflect the limited ability of marriage rates to adjust upwards to accommodate high levels of unwanted births, since marriage rates among black teenagers are generally comparable to rates for whites the same age."[73/]

In many cases, of course, legitimation is not really a feasible or attractive option. Absolutely no data are known which document the extent to which o-w pregnancy is the product of incest or sex relations with someone already married, but instances certainly occur. Bernstein and Meezan have documented other reasons for not marrying when pregnant in their study of 174 unmarried welfare mothers. In half the cases, the couple had broken up for reasons that imply that no viable marriage could have been formed--because of physical abuse, drug use, alcohol problems, other women, fights and financial irresponsibility.[74/] Thus marriage is not a good or available option for many unmarried pregnant women.

Table 33 presents another way of measuring the proportion of o-w conceptions that are legitimated by marriage. These data are based on women who married between 1965 and 1969; thus they do not represent women who have not yet married or who will not marry. Births occurring before marriage constitute nearly 5 percent of the births occurring to white females and nearly 32 percent of those occurring to black women who married during this time period. Another 15.4 percent of all white births and 26.8 percent of all black births occurred during the first 8 months of marriage and thus were probably conceived before the marriage. Twenty percent of the births to white women in this marriage cohort represent o-w conceptions, then, as do nearly 60 percent of the births to black women in the cohort. These data support the magnitude of difference by race that Zelnik and Kantner found in their study (Table 32). Since the

Zelnik and Kantner data represent the proportion of the o-w conceptions legitimated by marriage, they will be used in the model rather than data on the proportion of first pregnancies that were premaritally conceived.

TABLE 33: Cumulated First Births per 100 Women by Interval Since Mother's First Marriage, and by Race and Age of Mother

	White Women Married in 1965-69				Black Women Married in 1965-69			
		Age of Woman at Marriage				Age of Woman at Marriage		
	Total	14-18	19-21	22+	Total	14-18	19-21	22+
Before mother's marriage	4.9	4.0	3.2	8.3	31.5	24.7	29.8	41.7
5 mos.	9.9	12.6	7.4	10.6	45.0	43.8	43.9	45.0
6	14.5	20.0	11.4	13.2	53.0	53.3	49.8	48.6
7	17.9	25.3	14.5	15.0	55.8	58.2	52.3	49.5
8	20.3	28.8	17.0	16.3	58.3	61.1	54.8	51.4
9	24.2	33.6	20.8	19.3	60.5	63.3	59.0	53.7
10	28.3	38.7	24.7	22.9	62.7	66.7	61.6	55.5
12	32.8	44.0	28.6	27.4	64.7	70.4	64.5	57.1
18	52.1	65.2	49.3	42.5	75.9	83.3	78.4	67.2

Source: "Fertility Histories and Birth Expectations of American Women: June 1971," Current Population Reports, Series P-20, No. 263 (April 1974), p. 53, 55, 57.

F. Adoption of Children Born Out of Wedlock: A

Giving the child up for adoption has been a frequent course of action for unmarried mothers, but one which has become less common over the last several years. As illustrated in Table 34, despite the rising incidence of o-w childbearing, the number of children born out of wedlock and given up for adoption has fallen.

TABLE 34: Children Adopted in the United States, 1969-1972, Total and Proportion Out of Wedlock

	All Children Adopted	Adopted Children Born Out of Wedlock	Proportion of All Adopted Children Born Out of Wedlock
1972	154,000	87,800	57%
1971	169,000	101,000	60
1970	175,000	110,000	63
1969	171,000	109,000	64

Source: Office of Information Statistics, National Center for Social Statistics

In Kantner and Zelnik's study, 2 percent of the 221 blacks who bore o-w children gave them up for adoption, compared to 18 percent of the 39 whites.[75/] Greater availability of abortion may have reduced this incidence, since women who formerly chose to give up their babies for adoption may now chose to have an abortion. In 1972, there were 403,200 o-w births and 87,800 o-w children given up for adoption, over 70 percent to non-relatives. This suggests that 22 percent of children born out of wedlock at that time were given up for adoption in all, and that 16 percent were adopted by non-relatives. (A substantial number of o-w children are adopted by relatives such as grandparents, aunts and uncles). Although adoptions seem to have been under-reported by Kantner and Zelnik's respondents, national adoption statistics are not arrayed by race,

obscuring the tendency for adoption to be a much more frequent resolution among whites. Thus, once again, the data from the Kantner and Zelnik study constitute the best available estimate.

G. Female-Headed Households With an Out-of-Wedlock Child on Welfare: FHH-W

Forty-six percent of all AFDC families contain at least 1 o-w child.[76] Many people have argued that one factor exacerbating the incidence of o-w fertility is the availability of welfare support for o-w births. Although it seems somewhat unlikely that the meager welfare benefits available to female heads of families appear sufficiently attractive to induce a woman to become pregnant, it is possible that the availability of welfare support encourages a woman, once she is pregnant, to bear a child when she might otherwise have an abortion. Also, welfare may make it possible for a woman to avoid marrying the father of her child if she has doubts about his stability or earning ability. A teenager may see any amount of money as a source of independence, since it enables her to set up her own household free of parental control and supervision. In addition, the availability of welfare may be a deciding factor in whether an unwed mother keeps her child or gives it up for adoption. The attractiveness of the welfare option is affected, of course, by the size of the welfare benefit. In addition, the attractiveness of the benefit will be affected by the quality of the woman's alternatives, for example, the wage that she could earn on the market, as well as by her attitudes about being on welfare and her feelings about the importance of being married.

An interesting study done among New York City welfare mothers addresses some of these questions.[77] Nearly half of the sample were unmarried at the time of their last pregnancy. Although comparisons with a group of unmarried women who did not go on welfare are not made, the authors note that 87 percent of the women bearing their first child had not been on welfare at the time of

the conception. Thus, while the size of the pool of unwed mothers is not known, the main source of recruits does appear to be women who were not on welfare at the time of their first conception. Nearly 60 percent of the women at least discussed marriage with their men; however 87 percent of the relationships were no longer intact at the time of the study. The reasons that the women give for why the relationship broke up are reported in Table 35.

TABLE 35: Reason Relationship Broke Up (Unmarried Mothers on AFDC in New York City)

Reason	Percent
Other women	16.9
Constant fighting/emotional well-being	7.7
Financial irresponsibility	8.8
Drugs/alcohol/man in street	9.8
Physical abuse and its results	6.0
Relationship not broken	12.6
Pregnancy	13.1
Relationship was casual	4.9
Other and other combinations	20.2
	100.0% n = 183

Source: Bernstein and Meezan, 1975, Table 28.

It would appear from these reasons that many of the women had little latitude for deciding whether to marry. Possibly the women who were still seeing their men were avoiding legalizing a marital relationship in order to obtain welfare benefits. The level of assistance equalled or exceeded the man's income in 55 percent of the cases, so the benefits associated with this choice are real. It is also possible that the women who conceived in the context of a casual

relationship could have borne and kept the child in order to go on welfare; and perhaps those women who gave fighting, abuse, drugs and other women as their reasons for breakup of the relationship would have been more tolerant if welfare had not been available as an alternate means of support, although the desirability of maintaining such a relationship is questionable.

Forty-seven percent of the women reported that at the time of the breakup of their relationship, they planned to go on welfare, and 18 percent stated forthrightly that the availability of welfare influenced the decision to break up their relationship. (Ten percent of the formerly married respondents in the study reported that the availability of welfare had influenced the decision to end their marriage.) The tendency to agree that welfare had influenced their decision to live apart from their man was positively related to still being in touch and still being in love with their man. (Unfortunately, the authors do not present these latter data separately for never-married and ever-married women.) The authors reason that in perhaps 21 percent of the cases, marriage was disrupted or avoided in order to enable the family to maximize its income.[78/] These data refer, of course, to reasons that the parents of a child are not married, rather than the motivation, if any, for the conception. It should also be kept in mind that "for more than three-quarters of the women, the relationship was either marked by so high a degree of tension as to justify separation or the choice was not theirs to make." Deliberate manipulation

of family structure to maximize income may have taken place in 20-25 percent of all of the cases, then, with welfare playing a cushion role for women whose relationship did not work out for other reasons. These results may exaggerate the impact of welfare, since all of the women in the survey were women who did in fact end up on welfare. The impact of welfare would be more clear in a study that included women who did not go on welfare as a contrast. Unfortunately, the Zelnik and Kantner data are inadequate to fill this gap since so few of the young women in that sample formed an independent household supported by welfare. Exploration of this question using existing national probability surveys will probably consistently be undermined by small sample sizes. However, several researchers have approached the issue using aggregative state level data.

An early analysis of the question was conducted by Cutright.[79] He does not find a pattern of consistently higher benefits to be associated with increases in state o-w birth rates. Nor does he find states with high benefits and high coverage to have o-w birth rates higher than those states with low rates and low coverage. Unfortunately, the categories used in the analysis are simple dichotomies and do not permit a very refined analysis. As Ross and Sawhill note, "The comparisons he makes are gross comparisons which do not inquire into the effect of welfare on illegitimacy given that other factors may also be at work, some with offsetting effects. His comparison shows that welfare is not influencing illegitimate births so strongly that it can be detected without regard to any other factors which may be operating. This is certainly a finding...But it is not a finding of no welfare effect on illegitimacy."[80]

Winegarden has also studied the effect of variations in state welfare benefits on o-w childbearing.[81] Hypothesizing that the fertility of women receiving AFDC will be dependent on the size of the grant, on the increment in aid resulting from increases in family size, and on the availability of welfare benefits, he argues that welfare serves to reduce the costs of child en to recipients. He found the number of recipient children under age one per 100 welfare mothers to be somewhat responsive to benefit availability, but not to the level of the grants or to the marginal benefit for children beyond the first. He concludes that the certainty of assistance may have a modest impact on o-w fertility, but that the amount of such assistance is not important.

Cain has also examined the pronatalist impact of governmental assistance that is linked to the presence of children.[82] He reasons that implementation of an income maintenance law could encourage childbearing in several ways. First, as Winegarden hypothesized, the additional income permits a family to support more children. Second, the direct costs of child rearing will be reduced to the extent that increased assistance is related to family size. In addition, a disincentive to paid employment for women may exist due to the fact that most programs are designed so that assistance decreases as family income increases; women may alternatively bear more children. He did not find, however, that recipients of payments in the New Jersey Income Maintenance Experiment had higher fertility, whether receiving the relatively generous payments or the less generous payments. Of course, the short (3 year) time span and the lack of permanence of the program may have discouraged couples from adapting to the income increases in any way as permanent as adding a child to their family.

Fechter and Greenfield have also approached the issue from an economic perspective, arguing that the direct costs and opportunity costs of a child are offset by the "income transfer that the mother of the child can get by going on welfare. The larger the expected welfare payment, the lower will be these costs."[83/] Separate linear regressions were run for white and nonwhite females aged 20 to 24. The model included not only level of AFDC benefits, but education, unemployment and earnings of women, region of the country, income of intact families, and income of men. The coefficient for AFDC benefits was not found to be significant, suggesting that the level of welfare assistance does not influence o-w childbearing. Higher educational attainment was associated with lower o-w fertility for both whites and nonwhites; and higher female earnings were associated with lower o-w fertility among whites. Out-of-wedlock childbearing was also found to be lower in the South. Given the strong impact of education -- a one-year increase in schooling was associated with a reduction in o-w births of 8.6 per 1000 unmarried white females and 148.9 per 1000 unmarried nonwhite females -- the authors conclude that "this finding provides additional justification for human capital investment since a declining out of wedlock birth rate is one means of reducing the cost of the AFDC program." They also note that several important variables were omitted from the analysis for lack of information.

An analysis of a representative sample of New York City women who had just recently had a first child by Presser and Salsberg has also addressed the possible link between public assistance and fertility. Reporting that women on welfare want smaller families than women not receiving welfare, and are not significantly different from other women in their fertility-related attitudes and behaviors, they suggest that "in general, public assistance may be a consequence of an untimely birth rather than a stimulus for that birth."[84/]

In summary, most research so far has failed to document an aggregate association between o-w childbearing and welfare. The suspicion persists in the public's mind, nevertheless, that women have babies in order to get on welfare and that women on welfare have additional children in order to get more welfare assistance. Journalistic essays on welfare recipients -- for example, an article that appeared in New Yorker magazine in September, 1975 describing the daily life of a Puerto Rican welfare mother with her many children fathered by a number of husbands and lovers -- reach a far wider audience than empirical work on the topic and strengthen popular stereotypes concerning the wide abuse and manipulation of welfare. Open admission on the part of Bernstein and Meezan's New York Welfare clients that welfare availability influenced their living arrangements add to this impression. Does the welfare system encourage the bearing of children out-of-wedlock? Further empirical work addressing this question is presented in the next section of the paper.

To complete the task of the current section still requires development of an estimate for the accounting model. What proportion of the children born out-of-wedlock end up on welfare? Unfortunately, no data have yet been discovered that can provide a definitive proportion for the model. Although the number of out-of-wedlock children on welfare has been estimated, it is difficult to know the size of the pool from which these children are drawn. HEW has estimated that of the children not legitimated by marriage or adopted, up to 80 percent end up on AFDC. Senator Edward Kennedy has stated that 60 percent of unmarried mothers aged 15 to 17 require welfare assistance within five years.[85/]

An approximation of the probability can be calculated by comparing the number of o-w children receiving AFDC in the U. S. at a particular time (children who are typically under age 18) with the number of children born out-of-wedlock during the previous 18 years and not adopted. Data from the AFDC survey indicate that in 1973, nearly 2,435,000 children were on welfare whose fathers were not married to their mothers.[86/] Given that over 5,290,000 children were born

out-of-wedlock between 1954 and 1973,[87] of whom approximately a million were given up for adoption to non-relatives,[88] it would appear that the majority of the children born out-of-wedlock and not adopted out are, at any given moment, on welfare.

$$\frac{\text{2,435,000 o-w children on welfare}}{\text{5,290,000 o-w children born minus 1,000,000 o-w children adopted}} \text{ or } \frac{2,435,000}{4,290,000} = .568$$

Actually the true proportion is probably higher than the above calculation indicates, since there are several other factors that would tend to diminish the size of the denominator -- for example, deaths of children and legal adoptions by relatives such as grandparents -- while the numerator is not increased by any new entrants. On the basis of United States life table data,[89] one can estimate that about 3 percent of all children die by age 18, which would reduce the denominator to 4,161,300 (.97 x 4,290,000). This adjustment raises

$$\frac{2,435,000}{4,161,300} = .585$$

the proportion to nearly 59 percent. Additional adjustments -- for example, for the adoption of o-w children by relatives or eventual marriage of the mother to her child's father -- could be made if more detailed data were available. (It would also be highly desirable to have age/race-specific data.) Most such adjustments would tend to diminish the size of the denominator and increase the magnitude of the proportion. Thus, even though the estimate is fairly crude, it tends to err in a conservative direction. Therefore, although it sounds surprising at first, it does appear to be fairly safe to conclude that approximately 60 percent of the children who are born out-of-wedlock, who live and who are not adopted, are on welfare at any particular point in time.

H. Conclusions and Implications Based on the Accounting Model

Having developed a model for describing the process of o-w childbearing and having explored a considerable body of literature that can inform that model, it

seems worthwhile to put the model to the test. What utility does the model have? Can it predict, on an accounting level, the number of births that occur out-of-wedlock? What are the policy implications of the estimates that have been produced?

1. Numerical Estimation of the Model

Presumably, if the various estimates made in previous sections are accurate, one should be able to insert the numbers at the several stages of the accounting model and predict the number of out-of-wedlock births occurring in the United States. Since the most complete set of estimates exists for females aged 15 to 19, the best summary statistics for this age group have been extracted from the respective discussions and inserted into the model in Figure 5 to develop an independent estimate of the number of births occurring out-of-wedlock in the United States. This estimate can be compared with the number of births reported in United States Vital Statistics publications. To produce the final estimate, the population of white and black females enumerated in the 1970 Census is moved through the various stages and at each stage some proportion of young women are dropped out as not being eligible for an o-w birth.

In Step 1, the total population of white females (8,130,000) is multiplied by .88 to produce the population at risk (7,154,400), since 88% of the white females in this age group are single. A comparable calculation is done for black females.

Similarly, in Step 2, since only about 85% of this age group is estimated to be fecund, the number of single females is reduced by 15%. A more significant reduction occurs at the next step.

Kantner & Zelnik's finding that 23% of white females and 54% of black females age 15-19 have ever had intercourse is used in Step 3 as a crude indicator of the proportion who are sexually active. This assumes that having had intercourse once establishes a pattern of continuing sexual activity. Al-

Figure 5: A Model of Adolescent Out-of-Wedlock Childbearing

Steps	White Females Aged 15-19	Black Females Aged 15-19
P_{total} (1970)	8,130,000	1,220,000
1. x % single	x .88 = 7,154,400	x .89 = 1,085,800
2. x % fecund	x .85 = 6,081,240	x .85 = 922,930
3. x % of unmarried ever having intercourse	x .23 = 1,398,685	x .54 = 498,382
4. x % conceiving among unmarried sexually experienced, per year..	x .21 = 293,724	x .34 = 169,450
5. x % of unmarried pregnant not having legal abortions	x .69 = 202,669	x .68 = 115,226
6. x % of unmarried pregnant not having a miscarriage	x .92 = 186,456	x .92 = 106,008
7. x % of unmarried pregnant not marrying before birth	x .48	x .88
Estimated number of out-of-wedlock births	89,499 *	93,287 *
8. x % not adopted	x .39	x .88
	34,905	82,093
9. x % expected to be on AFDC	x .60 = 20,943	x .60 = 49,256

*Number of out-of-wedlock births recorded in 1974 U. S. Vital Statistics:

Whites	Blacks
85,000	121,200

though this does seem likely, there is undoubtedly considerable variation in the frequency and regularity of sexual intercourse, even considering only non-virgins. It is also quite possible that a continuing liberalization in sexual mores has occurred so that the current estimates are too low. These two sources of error may, of course, have off-setting effects. These speculations must remain unresolved, since we lack detailed and truly up-to-date data on the population at risk of conception. It is of interest to note the race difference here: over twice as many black females as white females report ever having had intercourse while teenagers. Thus the black population at risk is a far greater proportion of all blacks than is the case for whites.

Kantner and Zelnik report that 22 percent of the white females and 43 percent of the black females in a sub-sample of the sexually active teenagers in their study actually conceived. A number of factors affect these proportions, including contraceptive use, frequency and timing of intercourse, type of contraceptive used and duration of exposure (years since first intercourse). Although, unfortunately, data are not available to evaluate all of these factors, it is possible to control, albeit crudely, for the effect of duration of exposure. It seems plausible that if blacks initiate intercourse at an earlier age, they are exposed to pregnancy for more years, so that calculating an annual probability of pregnancy would remove some of the racial difference in the proportion who conceive. Indeed, counting the number of pregnancies and comparing them with an estimate of the number of months at risk (months after first intercourse until either first conception, a marriage not involving pregnancy, or until the interview date), by race, primarily affects the black probability. We find that sexually active white females have an annual probability of conception of .21, and that the comparable proportion for black females is .34. Further work on the other factors affecting the probability of conception would be most useful; however, these statistics

are really rather important. They suggest that one in three sexually active black teenagers and one in four sexually active white teenagers will become pregnant in a year's time.

The proportion of unmarried pregnant women who have abortions, included in Step 5 of the accounting model, hardly varies by race. Development of this number requires estimation of the total number of conceptions and involves some unfortunate though necessary and not unreasonable assumptions (see pages 65 - 66). It is worth noting that since fewer than a third (or perhaps about a third, since some unknown number of abortions go unreported) of all o-w conceptions are aborted, legal abortion could play a larger role in the prevention of o-w births, should women choose to abort more frequently as abortion services become increasingly available.

The proportion of spontaneous miscarriages reported to Kantner and Zelnik by adolescent interview respondents is introduced into the model in Step 6. It is virtually certain that more than 8 percent of all conceptions are miscarried, often without the woman even knowing that she was pregnant. The Kantner and Zelnik data are probably biased by deliberate underreporting as well. However, since we have no idea how to inflate the other percentages in the accounting model to add in the unreported pregnancies, it is necessary to accept it at face value.

Steps 7 and 8 represent two other important points in the process where the typical outcome for an unmarried pregnant white female is very different from that of an unmarried pregnant black female. Slightly over half of the whites interviewed by Kantner and Zelnik married in order to legitimate the pregnancy, while only 12 percent of the blacks did. Further, of the 221 blacks who reported o-w births, only 2 adopted out their child, compared to 8 of 39 whites. These numbers are obviously too small to accurately extrapolate from them to national figures, but they provide at least a "ball park" estimate of the racial distribution of the o-w children adopted. If 80 percent of the 72,000 o-w children

adopted in 1971 were white, then 57,600 or 61 percent of all white o-w births were adopted. If 20 percent of the 72,000 were black, then 14,400 or 12 percent of all black o-w births were adopted.

Finally, the proportion of children born out-of-wedlock who are expected to require AFDC support is inserted into the model at Step 9. Since economic status is likely to affect the proportions requiring welfare assistance, it would be preferable to have race-specific proportions (as well as age-specific proportions). However, the lack of detailed information necessitates the use of the same proportion -- 60 percent -- for both whites and blacks. Even so, the number of black o-w children estimated to end up on AFDC is greater than the estimated number of white children.

2. Some Implications of the Model

Studying the model and the data arrayed in Figure 5 alerts one to a number of important considerations.

First of all, there are several steps in the process that are simply not amenable to government intervention. For example, it does not seem appropriate to encourage early marriage in order to reduce the size of the population at risk, given the need for extended education and the liabilities attendant upon early marriage. Nor does it seem acceptable to reduce levels of nutrition or medical care so as to reduce the proportion who are fecund or to increase the incidence of fetal mortality. Although it is theoretically possible for governmental policies to encourage the unmarried to be sexually abstinent, such a policy orientation does not seem to be pragmatic or in line with recent Supreme Court rulings on privacy. This leaves only a few steps in the model at which governmental policy might legitimately or pragmatically play a role.

For example, governmental programs, or the lack of programs, might affect

the proportion of the sexually active population who become pregnant. Denial of family planning services and sex education to the unmarried can be expected to increase the likelihood of conception. Greater provision of such services could enhance the degree of choice available to the unmarried population. In addition, if it is true, as the research data suggest (see page 23), that most unmarried persons do not wish to become pregnant, delivery of family planning services to sexually active adolescents could have an enormous impact on o-w pregnancy rates. If the black teenage population had just the same proportion conceiving as among whites (22 percent), the number of black o-w births would be halved, from nearly 118,000 to about 60,000 births. This is not to say that the proportion of whites who conceive should be considered a goal. It is to say that there is a considerable need for the delivery of contraceptive services and knowledge about reproduction. Since such an alarming proportion of white females and twice as many black females become pregnant, though the majority report that they did not intend to, there appears to be an existing constituency for such assistance.

Black population at risk (Step 3)	498,382
Step 4 White conception proportion	x .22 109,644
Step 5 Black proportion not obtaining abortion	x .68 74,558
Step 6 Black proportion not having miscarriage	x .92 68,593
Step 7 Black proportion not marrying	x .88
Number of out-of-wedlock births	60,362

Abortion is another critical stage. According to our current estimates, more than two-thirds of both black and white teenagers who are unmarried and pregnant do not terminate their pregnancies by abortion. There is evidence of considerable unmet need for abortion services in the United States, as recently as 1975.[90/] To the extent that the utilization of abortion is low because abortion services are not available to those who need them, there is considerable room for governmental policies to have an impact at this stage.

In addition, present governmental policies may affect the probability of marriage in the direction of making marriage more difficult. In many states, AFDC benefits are available only to women without husbands in the home. Given the high rates of unemployment among nonwhites and among teenagers, such rules may inhibit marriage among parents who actually wish to marry.

It is also clear from the data assembled in the accounting model that the size of the population at risk is very large. The number of sexually active single female teenagers borders on two million. The size of the population in need of special knowledge and services, especially at these young ages, may come as a surprise to those who wish to see teenagers simply as school children.

The accounting model, by requiring that steps in the process of becoming an o-w parent be articulated, that literature be assembled, and that the best available statistics be selected, provides a check on the quality of the data available and of our conceptualization of the process. The estimate of the number of out-of-wedlock births produced by this model is strikingly similar for whites to the actual number of o-w births reported in the Vital Statistics system. We predict 89,499 white o-w births; there were actually 85,000 such births in 1974. The prediction of 93,287 o-w births to blacks is low, however; 121,200 such births were recorded. Perhaps the incidence or frequency of sexual activity has risen among blacks since these data were gathered. It seems unlikely that utilization of contraception or abortion has fallen in recent years; but it is possible that the diffusion of birth control services has not been sufficiently rapid to compensate for an increased level of sexual activity. Clearly, the numbers produced for the accounting model work are crude and can be further refined. In addition, a better understanding of the processes that produce the probabilities is needed. These several comments point up one important additional function of the accounting model endeavor.

The model and attendant literature review highlight the gaps in current research. Very little work has been done on the impact of governmental policies on nonmarital fertility. Very little is known about sexual and reproductive behavior outside marriage. We can count the offspring of unmarried people and estimate other important parameters, such as the proportion sexually active and the proportion having abortions, but we have little idea of what causes or explains the numbers. The next chapter represents an attempt to look at some important policy variables, to see whether there is any evidence that such factors as welfare benefits and family planning policies affect the incidence of out-of-wedlock childbearing.

CHAPTER IV. THE DETERMINANTS OF OUT-OF-WEDLOCK FERTILITY: DATA ANALYSIS

A. Introduction

In this chapter we report analyses of two complementary sets of data bearring on out-of-wedlock fertility. In both cases our purpose is to sort out the relative impact of certain factors, both individual and contextual or environmental, which existing evidence and/or our theoretical perspective suggest might reasonably be thought to influence the likelihood of a birth to an unmarried female. Those contextual factors which are direct, manipulable public policies are of special interest.

One of the data sets is micro; the unit of observation is an individual female. The second data set is macro; the unit of observation is a state. The strength of each set is also the weakness of the other. The micro-data file comes from individual survey interviews conducted in 1971 with a national sample of 4,611 females aged 15-19. This file is, to our knowledge, the best single source of national data on the relationship between the individual characteristics of a teenage woman and the likelihood of (1) sexual activity, (2) pregnancy,and (3) an out-of-wedlock birth. The weakness of the micro-data set is its paucity of information on some potentially important variables, such as income and socioeconomic status.

The macro-data file contains state-level observations on out-of-wedlock fertility rates plus a rich variety of other state-level contextual variables for the year 1974. Besides providing some variables not available on the micro-file, this file is also more recent. Its major weaknesses are: (1) the lack of evidence on the separate, temporally-ordered stages of the process leading to an out-of-wedlock birth (sexual activity, pregnancy, marriage, abortion),and

(2) the well-known difficulty of imputing inferences drawn from ecological, or aggregate, evidence to individual behavior.

Taken separately, each data set has weaknesses. Conclusions based solely on either one alone are more tenuous than conclusions supported by both files.

B. Description of the Micro-Data File

1. Overview

The micro-data file was generated by individual survey interviews with (1) a national probability sample of the female population, aged 15 to 19, living in households in the United States, and (2) a probability sample of university students living in dormitories. Together the two samples provided a total of 4,611 interviews, of which 1,479 were with black females and 3,132 were with whites and other races.*,** The only criterion for eligibility (besides sex) was age, with the provision that only one eligible female could be selected (randomly) from any one household (or any one room in a college dormitory). About 90 percent of the respondents had never been married. Respondents were questioned about their sexual and reproductive attitudes and histories, and about personal and family backgrounds. The data were collected during the spring and early summer of 1971 by the Institute for Survey Research, Temple University, under

* To simplify the presentation, both in the text and in the accompanying tables, whites and other races will be referred to simply as whites.

** A weight is attached to each observation, to inflate the sample to correspond to national estimates of the female population by race and single years of age, 14 though 18, in the 1970 Census of Population, and by the nine Census divisions and by five residential categories: (1) central cities of SMSA's of 1,000,000 or more; (2) the remainder of such SMSA's; (3) central cities of SMSA's of less than 1,000,000; (4) the remainder of such SMSA's; and (5) non-metropolitan counties. These weights were used in all regressions. This corresponds to the procedure employed by Zelnik and Kantner in their 1972 report for The Commission on Population Growth and the American Future.

the direction of Drs. John Kantner and Melvin Zelnik of Johns Hopkins University. A number of reports concerning these data have already been published by Drs. Kantner and Zelnik which have been of enormous usefulness to family planners, to the educational and medical community, as well as to social scientists.[91]

2. Reliability of the Micro-Data

Given the very personal nature of much of the information in this survey, the possibility of serious measurement error should be a major concern. Zelnik and Kantner[92] briefly discuss the possibility that under-reporting or misreporting of age at first intercourse might affect estimates of the incidence of premarital intercourse by age. However, they conclude that in the absence of reinterviews (originally planned, but never carried out) there is no direct way to make any empirical estimates of either under-reporting or misreporting.

DeLamater and MacCorquodale[93] have investigated the effects of three separate aspects of an interview schedule on reported sexual behavior: (1) whether lifetime sexual behavior was assessed by an interviewer or by a self-administered questionnaire; (2) the location of assessments of sexual behavior, whether in the middle or at the end of a lengthy survey; and (3) the order in which interrelated questions were asked. Data from both a student and a non-student sample consistently indicated none of the above variations affected reported sexual behavior in a significant way. Some under-reporting of behavior occurred in the questionnaire form but only with reference to the most intimate sexual acts. That the interview produced data of the same quality as the questionnaire contradicts the contention of some that questionnaires result in more valid reports in sensitive areas such as sexuality. DeLamater and MacCorquodale conclude that their results "add support to the growing body of opinion...that the difficulty of obtaining valid data from respondents about sensitive topics may have been consistently overestimated,

and that reports of sexual and other "threatening" behaviors may be relatively uninfluenced by methodological variations".

3. Analysis Strategy for the Micro-data

The survey data provide a snapshot of the population of adolescent females. Our purpose, however, is to understand the process(es) by which this snapshot came into existence. To accomplish this purpose, two key strategies were necessary.

The first strategy is conceptual: we conceive of an out-of-wedlock birth* as the end product of at least three separate processes which occur in the lives of never-married females: (1) beginning sexual activity, (2) becoming pregnant, and (3) carrying the pregnancy through to a live birth without marrying. The eligible populations for these three processes are, respectively: (1) all never-married females who have never had sexual intercourse (called "virgins" for the sake of brevity), (2) all never-married but sexually active females, and (3) all never-married, pregnant females. Each of the three transitions represents either a decision that is made by the female or an event that befalls her (in the case of many pregnancies and some sexual experiences). Each transition may have different causes. To speak of "the causes of out-of-wedlock fertility" is imprecise; it may refer only to the last stage of the process or it may lump together many determinants from each of the three stages. Clearly, any stage has "veto power" over the final outcome; to be eligible for a particular transition, the young woman has to have made the previous transition. Our strategy then, is to analyze each transition separately. Only after this

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* A reminder: out-of-wedlock birth in the micro analysis refers only to births to never-married women. It does not include births to divorced, widowed or separated women. That this component of out-of-wedlock fertility may be large is suggested by R. Rindfuss & L. Bumpass in "Fertility During Marital Disruption," paper presented at the annual meeting of the Population Association of America, Montreal, April, 1976.

is accomplished do we combine results from the several stages and determine the overall sensitivity of o-w fertility to changes at any of the three stages.

The second strategy is methodological: it involves reconstructing the dynamic behavior which produced the cross-sectional retrospective data. In effect we "take back" respondents from the interview date to their status at age 11. We assume that at age 11 all respondents were non-married virgins. Each cohort is then "aged forward," and, as this happens, some of its members begin sexual activity. Some of these become pregnant, and finally, these young women either marry or have an abortion or an o-w birth, at the ages specified in the survey interview. Once a female has "had" a first intercourse experience as she is aged forward, she is no longer eligible for the intercourse transition. Until a female either marries, aborts, or has a child out of wedlock, she is always eligible in a given year of age to make one of these transitions (but only one). The dichotomous dependent variable which describes the outcome of each transition is equal to 1 if the transition is made and 0 otherwise. Each age-year of each respondent in the survey is a potential observation in the data file. An example might help clarify the approach.

Suppose a particular female, aged 18 and never-married at the time of her interview, reports that her first sexual experience occurred at age 14, and that she underwent an abortion at age 16. In our analysis, then, she is a virgin during age-years 11, 12, and 13, and is eligible for the analysis centered on the transition to sexual activity during those years. A zero (for "no transition") is coded for age-years 12 and 13, but a one is coded for age-year 14, since she initiated sexual activity during that year. Having begun sexual activity during her 14th year, she would then be at risk in the pregnancy function, and no longer at risk of beginning sexual activity.

In short, the strategy is to follow each female from her 11th year of age through to her age at the date of the interview, observing each transition along the way, and exploring the relationship of various possible influences on the rate at which each of the transitions is made.

In addition to those variables made available for this research by the survey authors, a number of policy variables were added to the data set. Measures of AFDC coverage and availability, AFDC Unemployed Father coverage, abortion availability and family planning unmet need were attached to the record of each respondent for the state in which she resided at the time of the survey. (This does introduce some error for respondents who moved; however, it was not possible to trace the mobility pattern of respondents over time, to ensure greater accuracy.) The values for these variables for each state are reported in Appendix Table 1. In addition, a detailed description of all of the variables included in the analysis and the proportion of the sample falling into each category of each variable by respondent age and race is included in Appendix Table 2.

C. Description of the State Data

1. Overview

The state data file was constructed at the Urban Institute expressly for the ongoing analysis. Because of the desirability of doing an up-to-date analysis -- one that would focus on out-of-wedlock childbearing after the impact of the 1973 Supreme Court ruling on abortion and one that would reflect the impact of recent changes in mores regarding sex, childbearing, and women's roles -- 1970 Census data were not used. Since the most recent year for which state out-of-wedlock Vital Statistics data are available is 1974,* that year was selected as the year for analysis.

Unfortunately, statistical data are often not compiled on a state basis.

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* The data were available only as raw numbers. From these we calculated the out-of-wedlock birth rates.

Even when so computed, the data are rarely disaggregated by age, race, and sex. For example, unemployment rates by age, sex, and race are not available for all states. Therefore, measures that are second choices often must be substituted, such as the overall unemployment rate among all workers in a state. In addition, although it is usually possible to develop variables that measure program characteristics (since a state often either has a program or it does not), it is far more difficult, if not impossible, to capture the nuances in administration of that program from one state to another. Therefore, many variables are necessarily crude, and the data file has many unfortunate but unresolveable weaknesses. A mid-decade Census, or expansion of the Current Population Survey sample size so that reliable data were available for all states would facilitate state-level analyses of this type. The data file compiled represents, however, the best possible at this time. More detailed descriptions of how independent variables were defined or constructed is reported in Appendix Table 3. The construction of the dependent variable is summarized below.

2. Out-of-Wedlock Birth Rates for 1974

Vital Statistics reports that differentiate births according to legitimacy status are compiled in 38 states and the District of Columbia and are reported on an annual basis to the National Center for Health Statistics. Fertility data for these states for 1974 by mother's age and race and by legitimacy status of the birth were made available to Urban Institute staff prior to their formal publication to expedite the current analysis. Letters were sent to the remaining states, requesting data on the incidence of out-of-wedlock childbearing in each respective state. Data on out-of-wedlock births were obtained for whites in 46 states and for blacks in 37 states. (Since the black population is too small in some states for rates to be calculated, a number of states must be eliminated from the analysis of black out-of-wedlock childbearing.) Because of the variation among states in the composition of other racial and ethnic groups in

the United States, the analysis was conducted only for whites and blacks. The list of states included in the analysis is reported in Appendix Table 4 .

Out-of-wedlock fertility rates were calculated for race- and age-specific population sub-groups. Black and white rates were calculated separately, since, as noted earlier, the out-of-wedlock birth rates are very different and it is considered possible that different social and policy variables affect whites and blacks differently. The rates are also age-specific, since age is hypothesized to be related to fecundity, degree of sexual activity, and the probability of marriage. Rates have been calculated for females under age 15, age 15 to 19, age 20 to 24, and age 15 to 44.

To calculate out-of-wedlock fertility rates, the number of births occurring out of wedlock in each state age/race group was divided by the estimated number of women in each age/race group. This estimate was produced by adding the number of women who were tabulated in the 1970 Census as single, widowed, and divorced within each age/race group and correcting the total to correspond with total population growth or decline in the state between 1970 and 1974.

D. Developing Empirically Testable Models of Out-of-Wedlock Childbearing

As already noted, an out-of-wedlock birth occurs if and only if three conditional events occur:

- there is a transition to sexual activity;
- given sexual activity, a premarital pregnancy occurs; and
- given pregnancy, there is no abortion (legal, illegal, or spontaneous) and no marriage before the birth.

Our empirical work is organized around these transition points. Figure 2 in Chapter III provides a schematic outline of the conceptual framework. We now present the theoretical arguments that guided our choice of the variables to be included in the analysis of each transition.

1. Influences on the Transition from Virginity to Sexual Activity

a. Biological & Social Maturity: Interest in sex clearly increases with biological (and perhaps social) maturity and thus with age. There are individual differences in maturity, some adolescents maturing at an early age and others not until a much later age: but among the population as a whole we would expect an increasing proportion to fall into the "mature" category at each age level. This purely maturational progression may be augmented by environmental factors relating to peer-group attitudes, the extent and type of exposure to the opposite sex, as well as parental acceptance, and indeed encouragement, of dating. These considerations make age an important independent variable in explaining sexual activity.

b. Attitudes and the Strength of Social Controls. Every known human society has been characterized by social strictures and taboos concerning sexuality with the result that sexual activity among the young is usually below its biological maximum. Attitudes vary across cultures and over time as well as between groups within a single culture. In our analysis religion, religiosity, birth cohort, and region will be used as proxies for attitudes concerning sexual activity. Variables measuring the strength of social controls on the behavior of the young include family structure (two-parent, female-headed family, other) and type of community (e.g., central city residence). Birth cohort is expected to be a particularly important factor given evidence (see pages 39-45 above) of a more permissive set of values in recent years. In the state analysis the percent of the state living in SMSAs and the percent Catholic represent this variable.

c. Motivation to Avoid Pregnancy and Childbearing: Abstinence from sexual activity can be viewed as a form of birth control, especially among young unmarried women. The motivation to practice such abstinence may vary with the availability of alternatives to childbearing (such as continued education or favorable employment prospects). In our analysis we will use various measures of parental social class and of female labor market opportunities as indicators of the availability of such alternatives. We also examine the possible impact of the availability and generosity of AFDC benefits. These benefits are presumed to reduce the motivation to avoid childbearing, since such transfers are not available to women without children.

d. Availability and Cost of Contraceptives and Abortion. Where contraceptives or abortion are inexpensive and widely available to teenagers, they can be substituted for abstinence as a form of birth control. Thus, we will test the hypothesis that there is a positive relationship between the availability of abortion or contraceptive services and sexual activity.

In the case of the 1974 state analysis, the abortion environment is measured by (1) a three-category ranking of states as to abortion availability, (2) whether there is Medicaid coverage for

abortion, and (3) the age below which parental consent for abortion is required. In the individual analysis, states are grouped into three categories according to the relative liberality of their policies in 1971.

The variables used as proxies for the contraceptive environment in the state analysis include: (1) family planning patients served per 1,000 women in need of subsidized family planning, and (2) the age below which parental consent for contraception is required. In the 1971 individual analysis, it is necessary to use a somewhat different measure: unmet family planning needs as estimated by Planned Parenthood.

2. The Determinants of Conception among the Sexually Active

a. Motivation to Avoid Pregnancy and Childbearing. While educational opportunities, employment prospects, and the availability of welfare could influence a young girl's decision to be sexually active, as noted above, we suspect that these factors are more likely to influence her motivation to practice contraception. Thus, this same set of variables is expected to affect the probability that conception will occur among those having intercourse.

b. Cost and Availability of Contraceptive Services. Since the probability of conception is lower when contraception is used than when it is not (see the accounting model and the discussion on pages 45-50 above), it is hypothesized that conception rates will vary with the contraceptive environment as measured by the same set of proxies described above.

Note that we have hypothesized a positive effective of contraceptive environment on sexual activity but a negative effect on conception among the sexually active. One cannot say *a priori* which effect might be stronger in the determination of the out-of-wedlock birth rate.

c. Knowledge of How to Prevent Conception. Whatever the contraceptive environment, better-educated young women tend to use contraceptives more effectively.[94/] In addition, they may be better informed about the reproductive cycle and the likelihood of conception after intercourse.

In an attempt to capture these knowledge effects, we control for the median educational attainment of women by race in the state analysis and for a young woman's age, cohort, and mother's education in the individual analysis. Older women, those belonging to the most recent cohorts, and those with better-educated mothers are presumed to be better informed. Unfortunately, direct measures of the respondent's own education and knowledge of reproduction could not be used even in the individual analysis because of the retrospective character of the survey (i.e., such information pertains to educational attainment or knowledge at the time of the interview which may be very different from the values of these variables at an earlier period).

d. Attitudes toward Contraception. Because some religious groups prohibit the use of contraception, or at least the most effective contraceptives, some control for this variable is desirable. Note that religion, like the abortion-contraception environment, may have offsetting effects on out-of-wedlock childbearing. Catholicism, for example, is expected to reduce sexual activity but increase the probability of conception among the sexually active.

e. Cost and Availability of Abortion. The possibility that abortion may be used as a substitute for contraception suggests the additional hypothesis of a positive relationship between the liberality of the abortion environment and conceptions. Again, we note that there may be offsetting effects of abortion on out-of-wedlock childbearing. Ready availability of abortion, if it leads people to rely on abortion rather than abstinence or careful contraception, could lead to greater sexual activity and also to more conceptions among the sexually active. On the other hand, abortion availability may be associated with fewer live births among those who become premaritally pregnant.

f. Fecundity. Since fecundity increases with age (among adolescents), so does the probability of conception. Thus, in the individual analysis we control for age when examining conceptions among the sexually active. In the state analysis, this should not be necessary since there is presumably little variation in age structure by state among the relevant adolescent populations.

g. Frequency of Sexual Activity. Frequency of intercourse clearly affects the probability of conception. Although there are no good measures of this variable in our data sets, one factor that might be related is family composition. Two parents in a stable, intact family might be more able to monitor and supervise their child's activity, reducing exposure to intercourse.

3. The Determinants of Out-of-Wedlock Births among Pregnant Women.

Premarital pregnancy terminates in an out-of-wedlock birth only in those cases where there is no abortion or marriage before the birth of the child. Thus, at this stage of the analysis, we need to look at the likely determinants of abortion and marriage.

3-1 Probability of Abortion.

a. Motivation to Avoid Childbearing. As already discussed, the motivation to avoid childbearing will depend on the availability of alternative uses of the prospective mother's time and the availability and amount of welfare support for unwed mothers. These variables, in turn, are expected to affect the probability that a pregnant woman will seek an abortion.

b. Cost and Availability of Legal Abortion. Given the motivation to prevent a birth, we would expect fewer such births where abortion was legal, readily available, and inexpensive.

c. Attitudes toward Abortion. Since utilization of available abortion services may depend on deeply-held beliefs about when human life begins and under what circumstances it should be terminated, there may be variation in the incidence of out-of-wedlock births by respondent's religion and religiosity.

d. Spontaneous Abortion. The incidence of spontaneous (noninduced) abortion may vary with health status and thus with social class. It could also vary with age.

3-2 Probability of Marriage

In a great many cases of premarital pregnancy, marriage takes place before the birth of the child and an out-of-wedlock birth is thus avoided. The desirability or feasibility of marriage for an unmarried pregnant woman is expected to be related to factors affecting the ability of a woman to support herself outside of marriage relative to within marriage.

High welfare benefit levels and high female income relative to male income might enable women to avoid marriage if they wish. The existence of an AFDC unemployed father (AFDC-UF) program in the state and labor market prospects for young men (as measured by their unemployment rate) might, on the other hand, facilitate marriage.

Tables 36, 38, 40 and 42 summarize the variables used at each stage for each data set.

E. Results from the Micro Analysis

1. The Transition to Sexually Experienced

Table 36 lists the set of independent variables used in analyzing the transition to sexual activity and indicates the theoretical reasons for their inclusion in each case. Some of the variables are poor proxies for the underlying constructs and the theory itself needs to be refined. At the same time, as a pioneering attempt to analyze sexual behavior in a multivariate and dynamic framework, the results should be of some interest. Regression results are reported in Table 37 and, in a slightly different form, in Figures 6 and 7. In each case, the results are reported separately for each age group -- young adolescents (age-years 12-15) and older adolescents (age-years 16-18) -- and separately for blacks and whites.

In Table 37, the results reported under the column head "Regression 1" were generated using the full equation while those under the column head "Regression 2" were produced when independent variables of marginal importance were deleted from the equation.* Although R^2s are very low, they are all significant at least at the .05 level. Of course, introducing race as a variable would increase the R^2 substantially, but we have chosen to do the analyses separately for substantive reasons. Coefficients that are twice their standard error are marked with an asterisk; however, the statistical significance of a single coefficient can be misleading unless viewed in context. It is the overall pattern of the coefficients for each variable that is important. These patterns can best be represented pictorially.

The results in Figures 6 and 7 represent adjusted probabilities. They are adjusted so as to be net of the effects of all of the other variables in the model, and are derived directly from the regression coefficients in Table 37. They can be interpreted as the probability that a female with a particular characteristic who is a virgin at the beginning of the year will have a first intercourse experience during that year. For example, the overall annual probability

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*Variables were deleted because of the absence of either a statistically significant or a substantively interpretable association with the dependent variable. Statistical significance was not deemed to be an appropriate single basis for omission of variables, since only the significance levels of the individual dummy variables can be reported. /Calculation of significance levels for each whole variable, as opposed to its dummy variable components, (e.g., church attendance as opposed to the dummy variables, "no services," "1-2 times," etc.) would require running highly costly regressions that would omit each independent variable one at a time, and then checking for a statistically significant improvement in the R^2 due to the addition of the respective independent variables./ Instead of solely relying upon statistical significance, readers should also direct their attention to the overall patterns and magnitude of relationships.

Table 36 : Independent Variables Used in the Micro Analysis of the Transition to Sexual Activity*

Theoretical Determinants	Variables Used as Proxies in Inicial Regression	Variables Retained in Final Regression
Biological and social maturity	Age	Age
Attitudes and the strength of social controls	Education of father or male raiser Birth cohort Church attendance Whether Catholic Structure of family of origin Region Farm background Importance of religion to respondent Urban/rural residence	Education of father or male raiser Birth cohort Church attendance Structure of family of origin Region
Motivation to avoid pregnancy and childbearing	Structure of family of origin Education of father or male raiser AFDC benefits AFDC acceptance rate Education of mother or female raiser	Structure of family of origin Education of father or male raiser
Availability and cost of birth control	Family planning needs unmet Abortion availability	

* These variables are defined in greater detail and the distribution of the population is reported in Appendix Tables 1 and 2.

TABLE: 37 Transition to Sexual Experience--Unstandardized Regression Coefficients, by Age and Race (Analysis of Micro Data File: Females 15-19 in 1971)

	Whites				Blacks			
	Age Years 12-15		16-18		Age Years 12-15		16-18	
Age- Year	Rgr. 1	Rgr. 2	Rgr. 1	Rgr. 2	Rgr. 1	Rgr. 2	Rgr. 1	Rgr. 2
12	.000	.000	-	-	.000	.000	-	-
13	.003	.003	-	-	.010	.010	-	-
14	.013*	.013*	-	-	.045*	.045*	-	-
15	.035*	.033*	-	-	.124*	.123*	-	-
16	-	-	-.112*	-.108*	-	-	-.164*	-.146*
17	-	-	-.065*	-.062*	-	-	-.071	-.056
18	-	-	.000	.000	-	-	.000	.000
Cohort								
1955	.000	.000	-	-	.000	.000	-	-
1954	-.007·	-.008*	-	-	.019·	-.019·	-	-
1953	-.014*	-.014*	.000	.000	-.038*	-.037*	.000	.000
1952	-.010*	-.010*	-.053*	-.052*	-.065*	-.064*	-.074·	-.069·
1951	-.022*	-.023*	-.069*	-.066*	-.068*	-.064*	-.028	-.023
Church Attendance								
No services	.022*	.023*	.125*	.121*	.046*	.050*	.097·	.110·
1-2 times (last month)	.020*	.020*	.115*	.113*	.014	.018	.066	.082
3-4 times	.006	.005	.043·	.046*	.005	.007	.016	.032
5-6 times	.007	.006	.022	.026	.010	.014	.038	.065
7 or more times	.000	.000	.000	.000	.000	.000	.000	.000
Residence								
Central City	.004	.011*	-.011	.045·	.087·	.061*	.260	.176*
Suburbs of SMSA	.000	.006	-.049	.006	.068	.039·	.216	.110
Non-SMSA/non-farm	.009	.014*	-.027	.024	.081·	.062*	.192	.106
Farm	.000	.000	.000	.000	.000	.000	.000	.000
Region								
Northeast	-.012	-.017*	-.059	-.040*	.014	-.014	.407*	.192*
North Central, Mountain	-.009	-.010*	-.051	-.035	.024	.016	.359*	.198*
South	-.016·	-.019*	-.057	-.020	.010	.005	.351*	.229*
Pacific	.000	.000	.000	.000	.000	.000	.000	.000
Farm Background								
Always lived on farm	-.006		-.083·		.028		.084	
Sometimes	-.009*		.031·		.016		.098·	
Never lived on farm	.000		.000		.000		.000	
Whether Catholic								
Catholic	.003		.013		.006		-.037	
Non-Catholic	.000		.000		.000		.000	
Family Structure When Respondent Aged 10-15								
Mother and Father	-.033*	-.033*	-.045	-.050	-.024*	-.028*	-.039	-.040
Mother only	-.024*	-.024*	.025	.020	-.016	-.020	.006	.006
Other	.000	.000	.000	.000	.000	.000	.000	.000
Education of Mother or Female Raiser								
Fewer than 9 years	-.001		-.023		.001		.091	
9-11 years	.002		.015		-.009		.089	
High school	.003		-.004		-.016		.034	
Some college	-.001		.018		-.024		.046	
College	-.003				-.030		.258*	
No female raiser & don't know	.000		.000		.000		.000	

Education of Father or Male Raiser								
Fewer than 9 years	.002	.003	.070*	.075·	.008	.006	.034	.110*
9-11 years	.001	.003	.065·	.076·	-.008	-.013	.037	.097·
High School	-.008	-.007	.054·	.058·	-.010	-.022·	-.011	.040
Some college	-.011	-.011	.049	.054	-.015	-.030·	-.047	-.008
College	-.002	-.003	.058·	.060·	-.047*	-.067*	-.190*	-.062
No male raiser & don't know	.000	-.002	.000	.023	.000	-.011	.000	.163*
		.000		.000		.000		.000
AFDC Benefits Relative to Median Income in Respondent's State								
≤.23 (Low)	.005		-.035·		.017		.060	
.24-.30 (Medium)	-.003		-.047*		.018		.075	
≥.31 (High)	.000		.000		.000		.000	
AFDC Acceptance Rate								
≤.50 (Low)	.002		.078*		.026*		-.019	
.51-.74 (Medium)	-.004		.048*		.023*		.066	
≥.75 (High)	.000		.000		.000		.000	
Abortion Availability in State of Residence								
Liberal	.004		-.013		.002		.122	
Intermediate	.000		-.006		.006		.129·	
Conservative	.000		.000		.000		.000	
Family Planning Needs								
High Unmet Need	-.002		-.017		-.019		.027	
Medium	.003		-.028		.009		.061	
Low Unmet Need	.000		.000		.000		.000	
R^2	.02	.02	.05	.04	.06	.05	.07	.05
Corrected R^2	.02	.02	.04	.03	.05	.05	.03	.03
F	6.56	9.74	4.19	5.38	7.58	11.22	1.82	2.31
N	(11,471)		(2,781)		(5,157)		(940)	

Note: This table is repeated with standard errors added in Appendix Table 5.

* Beta ≥ 2 times its standard error.

· Beta = 1.5 - 2.0 times its standard error.

FIGURE 6: Annual Probabilities of F..st Intercourse, by Age (White Females)

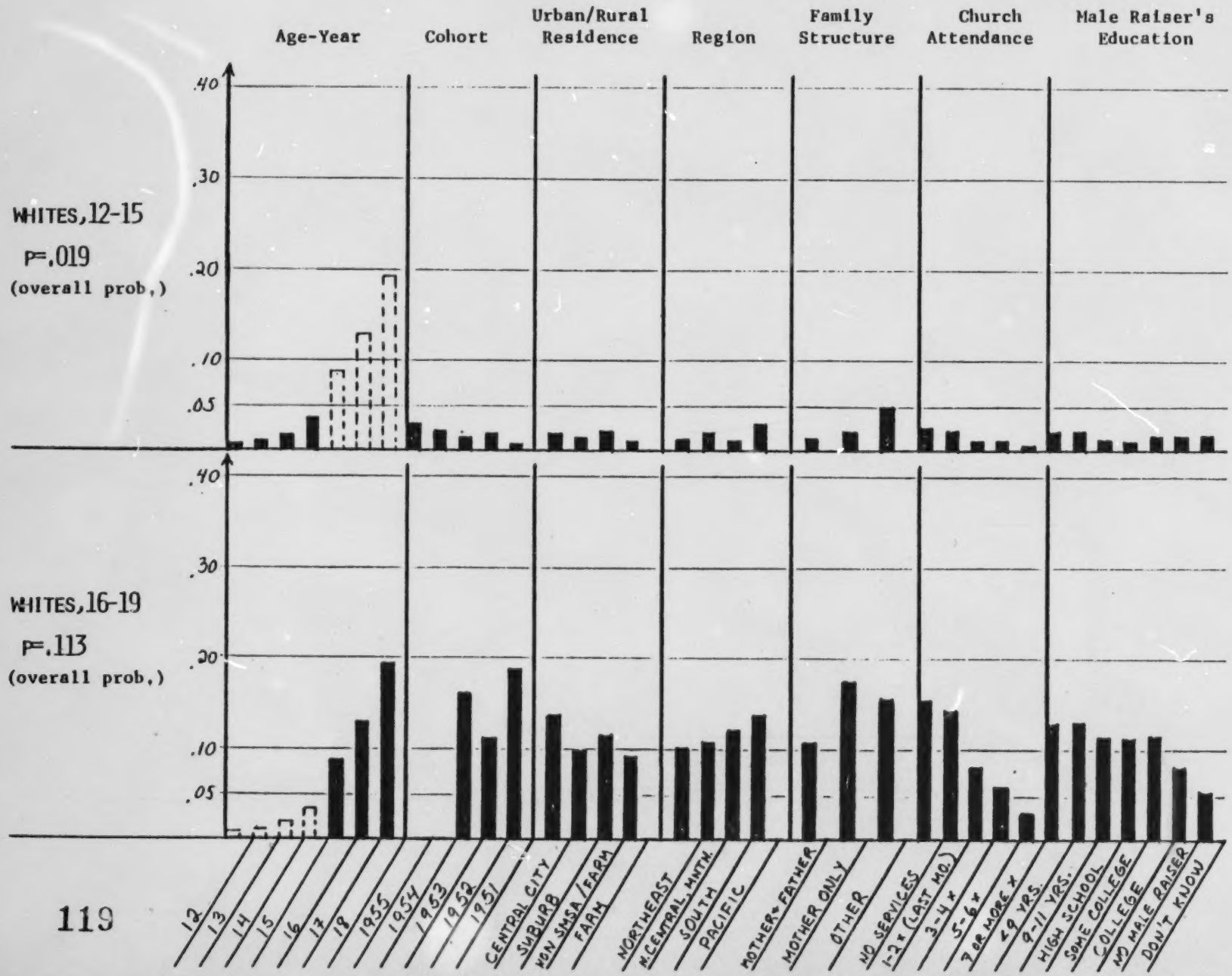
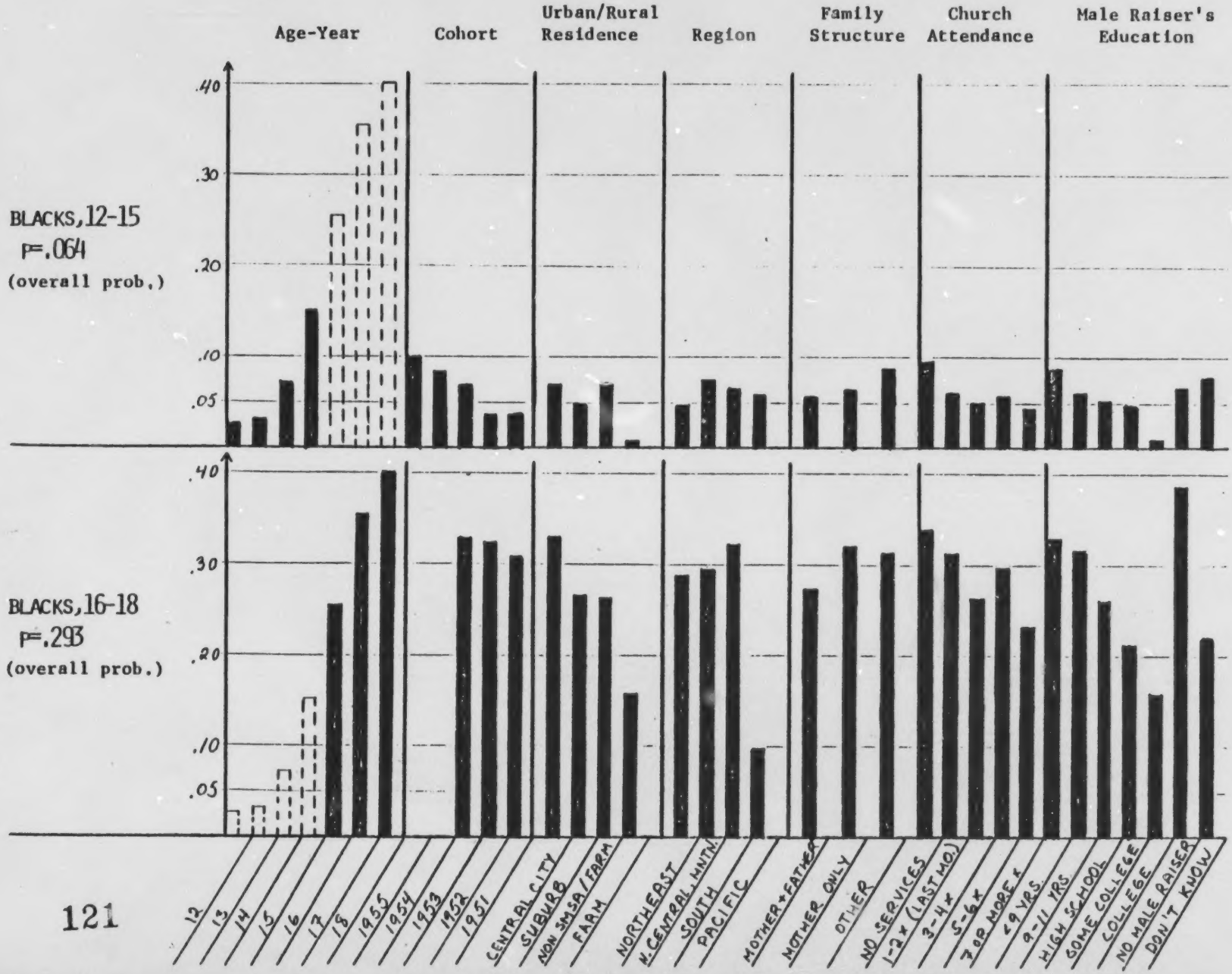


FIGURE 7: Annual Probabilities of First Intercourse, by Age (Black Females)



that a white female virgin aged 16 to 18 will have intercourse for the first time is .113, or about 11 percent. However, the probability is nearly 14 percent if she resides in the inner city, compared to about 9 percent if she resides on a farm. Although many of the differences are small in absolute terms, e.g., only 5 percentage points in the example above, it should be kept in mind that they are annual probabilities, and that, over a period of years, the cumulative impact of even small differences can be important.

Which variables predict having a first intercourse experience while a teenager?

As expected, age as a measure of biological and social maturity is a strong predictor. Fewer than one in one hundred white twelve-year-olds can be expected to initiate sexual activity, compared to nearly one in five eighteen-year-olds. While blacks are approximately twice as likely to begin sexual activity at each age, the probability increases steadily with age among each race group. Also, there is a fairly sharp increase in the annual probability around age 16 among both blacks and whites.

A number of proxies for attitudes and social controls predict the onset of sexual activity. Looking at year of birth as a measure of changing social mores, it does seem that more recent cohorts have a higher likelihood of beginning sexual activity. The strength of this change is surprising, since the data cover only a five-year time period. During this period, the proportion of the teenage population at risk of pregnancy increased rather rapidly. (We will explore the impact of this change in detail in a later section, pages 138-156 .)

Frequency of church attendance is also strongly related to whether a young woman becomes sexually active. The more frequently she attends church services, the less likely a young woman is to become sexually experienced during any particular year. This relationship holds among all four age-race groups and is nearly linear. Whether the inhibiting influence of religiosity is specifically related to church teachings regarding sex, to a more general conservatism on moral questions, or to the influence of family life style is not known. Being Catholic is not significantly related to the likelihood of initiating sexual activity; however, Catholics consistently have a slightly higher probability.

Family structure seems to have an impact on the likelihood of early first intercourse. Young women who lived in intact families between the ages of ten and fifteen are consistently more likely to be virgins. Interestingly, the girls living in female-headed households at young ages have a relatively low probability of making the transition as well, although they catch up later. Unfortunately, it was not possible to control for income of the respondent's family of origin with these data, which might account for some of the difference apparently associated with family structure here (since intact two-parent families tend to have higher incomes than single-parent families). It is also possible, however, that single parents, given the many demands on their time, are less able to supervise the behavior of their offspring.

Geographic region of residence bears an interesting, if not unexpected, relationship to the initiation of sexual activity. White (non-black) females living on the Pacific coast are more likely to be sexually experienced than white females from other regions. Older blacks living on the Pacific coast, are, on the other hand, considerably less likely than blacks in other regions to be sexually experienced, although the fact that this pattern is not replicated among

the young blacks makes it somewhat suspect.

Teenage females living on a farm at the time of the survey were found to have a lower probability of becoming sexually active than females living elsewhere. Teenagers living in suburbs tend to have a relatively low probability as well, whereas those in central cities tend to have a high rate of transition; the remaining category (non-SMSA, non-farm) is a residual category which, not surprisingly, does not evidence a coherent pattern.

Although education of the female raiser is not strongly or consistently related to the transition to sexual activity, the education of the male raiser tends to be negatively associated. This relationship may occur for a variety of reasons. Young females with better-educated fathers are presumed to enjoy a higher class status and to have attractive long-term opportunities (such as the prospect of a college education) that lead them to postpone becoming sexually active. It is also possible that the roles and norms of dating couples vary by class sufficiently to produce part of these differences.

Within the various subcategories, blacks consistently have a higher probability of first intercourse at an early age. It is unfortunate that a measure of family income was not made available for this analysis, since income differences might well account for much of the race difference in sexual activity. Father's education is the best available proxy for family income, and we do find, for example, that among older teenagers with college-educated raisers, the transition probabilities are more similar -- about 12 percent for whites and 16 percent for blacks. Economic status is a variable meriting further attention in future studies.

Finally, none of the policy variables included in the equation to measure the motivation for pregnancy and childbearing are related to the likelihood of sexual activity, with two exceptions. First, high AFDC benefits are associated with a

significantly higher probability of sexual intercourse among older white virgins. On the other hand, a higher AFDC acceptance rate is significantly associated with a low probability of sexual intercourse among older whites and younger blacks. Neither of these findings are replicated across the several age and race groups, however. In addition, (as will be reported), subsequent analyses with this and a macro data set have produced no positive associations between welfare generosity and the probability of conception among those who are sexually active or between welfare and the probability of an out-of-wedlock birth. This makes the association reported above the only instance of a welfare effect, suggesting that it may be an artifact (especially since one would expect welfare benefits, which are paid only to people with children, to have more of an effect on pregnancy than on sexual activity). The second exception involves a positive association between abortion availability and sexual activity among older black teenagers; however, this finding is of very marginal statistical significance.

In summary, we find that women are more likely to be sexually active if they are older, if their father or male raiser is less well-educated, if (among whites) they live on the West Coast, and if they are from more recent age cohorts. Teenage females are less likely to be sexually active if they tend to be religious, if they are white, if they come from intact families, and if they live on a farm. Finally, the education of the mother, Catholicism, welfare benefits and the availability of family planning do not seem to be important influences on the occurrence of sexual intercourse at an early age, although

abortion availability is weakly related to a higher rate of transition among older black female teenagers, and high AFDC benefits are correlated with a higher transition probability among older whites.

2. The Transition to Pregnancy

Variables included in the initial and final regressions for this analysis stage are listed in Table 38. The regression coefficients are reported in Table 39 and the calculated probabilities portraying the likelihood of pregnancy among sexually active females with differing personal and social characteristics are portrayed in Figure 8 for whites and Figure 9 for blacks.

Several variables were included as measures of possible influences on the motivation to avoid pregnancy and childbearing. However, the hypothesis that generous AFDC benefits and high AFDC acceptance rates would be associated with a greater incidence of pregnancy was not supported. The education of the male raiser was not found to be associated with the probability of pregnancy, either. On the other hand, both measures of the cost and availability of contraceptive services were found to be related to the occurrence of pregnancy.

The availability of family planning services was measured using data prepared for the U.S. Office of Economic Opportunity: percent of need for family planning services in a state unmet in 1969.* Among older blacks, women residing in states with the least unmet need for subsidized family planning services have significantly lower annual pregnancy probabilities. This finding is not

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* Unmet need defined as the total number of women in need of subsidized family planning services minus the unduplicated number of patients reported as receiving services in 1969 from organized services. For exact formula, see "Need for Subsized Family Planning Services: United States, Each State and Count," 1968, United States Government Printing Office, Washington, D. C. (1969), p. 238. Data for this variable were taken from J. Dryfoos, F. Jaffe, D. Weintraub, J. Cobb and C. Bernsohn, "18 Months Later: Family Planning Services in the United States, 1969," Family Planning Perspectives, Vol. 3, No. 2 (April 1971), pp. 29-32.

Table 38 : Independent Variables used in the Micro Analysis of the Transition to Pregnancy

Theoretical Determinants	Variables Used as Proxies in Initial Regression	Variables Retained in Final Regression
Motivation to avoid pregnancy and childbearing	Education of father or male raiser AFDC benefits AFDC acceptance rate	
Cost and availability of contraceptive services	Contraception use * Duration since first intercourse * Family planning needs Urban/rural residence	Family planning needs
Knowledge of how to prevent conception	Education of mother or female raiser Birth cohort	Education of mother or female raiser Birth cohort
Attitudes toward contraception	Whether Catholic Importance of religion to respondent	Whether Catholic Importance of religion to respondent
Cost and availability of abortion	Abortion availability in state of residence	
Fecundity	Age	Age
Frequency of sexual activity	Cohort Structure of family of origin	Cohort Structure of family of origin

* These variables were interacted with one another. See Appendix Table 2, variable B-9.

TABLE 39: Transition to Pregnancy--Regression Coefficients, by Age & Race (Analysis of Micro Data File: Females 15-19 in 1971) *

	Whites				Blacks			
	Age-Years 12-16		17-19		Age Years 12-16		17-19	
	Rgr. 1	Rgr. 2	Rgr. 1	Rgr. 2	Rgr. 1	Rgr. 2	Rgr. 1	Rgr. 2
Age-Year								
12 & 13	.000	.000	-	-	.000	.013	-	-
14	.073·	.072·	-	-	.024	.046	-	-
15	.116*	.116*	-	-	.108*	.130*	-	-
16	.097*	.094*	-	-	.112*	.133*	-	-
17	-	-	.080*	.094*	-	-	.009	.047
18	-	-	.076*	.083*	-	-	.068	.087
19	-	-	.000	.000	-	-	.000	.000
Cohort								
1955	-.033	-.039	-	-	-.134*	-.137*	-	-
1954	-.076*	-.077*	-	-	-.055·	-.064·	-	-
1953	-.026	-.031	.000	.000	-.076*	-.093*	.000	.000
1952	-.040	-.044	.033	.025	-.077	-.089*	-.028	-.025
1951	.000	.000	.037	.037	.000	.000	-.080·	-.067
Residence								
Central City	.011		-.043		.025		.080·	
Suburbs of SMSA	-.011		-.043		.002		.000	
Non-SMSA/non-farm	.027		.015		.036		.000	
Farm	.000		.000		.000		.000	
Whether Catholic								
Catholic	.016	.017	-.014	-.014	.094*	.080·	.118·	.141*
Non-Catholic	.000	.000	.000	.000	.000	.000	.000	.000
Family Composition (At ages 10-15)								
Mother and Father	-.004	-.007	-.017	-.020	-.018	-.028	-.117*	-.138*
Mother only	.016	.017	.008	.019	.044	.035	-.129*	-.123*
Other	.000	.000	.000	.000	.000	.000	.000	.000
Education of Mother or Female Raiser								
<12 years	.032	.014	.000	.000	-.064	-.036	.087	.048
High school	.005	-.012	-.058*	-.063*	-.097·	-.090·	-.016	-.058
Some college) College)	-.008	-.009	-.080*	-.099*	-.164*	-.150*	-.048	-.079
No female raiser & don't know or won't tell	.000	.000	+	+	.000	.000	.000	.000
Education of Father or Male Raiser								
< 12 years	-.082·		-.084		.061		.004	
High School	-.091·		-.049		.042		-.004	
Some College	-.044		-.095·		-.013		-.014	
No male raiser	-.136·		.000		.075		.089	
Don't know	.000		.000		.000		.000	
Importance of Religion to Respondent (continuous variable)	-.012	-.007	-.028*	-.030*	-.002	-.009	.040·	.040·

Contraceptive Risk									
Duration	User								
Low	Yes	.069	.059	-.060	-.041	-.058	-.044	-.217*	-.264*
Low	No	.020	.013	-.045	-.015	-.024	-.005	-.280*	-.296*
Medium	Yes	.122*	.113*	.019	.042	.120*	.136*	-.013	-.138
Medium	No	.130	.125	.128	.154	.150*	.164*	-.028	-.042
High	Yes	.073	.059	.016	.047	.077	.082	-.042	-.060
High	No	.000	.000	.000	.000	.000	.000	.000	.000
AFDC Benefits Relative to Median Income in Respondent's State									
≤.23	(Low)	-.016		-.035		.084*		.045	
.24-.30	(Medium)	-.018		.026		.052		.092	
>.30	(High)	.000		.000		.000		.000	
AFDC Acceptance Rate									
≤.50	(Low)	.056·		-.056·		-.041		.050	
.51-.74	(Medium)	-.005		-.005		.033		.015	
≥.75	(High)	.000		.000		.000		.000	
Abortion Availability in State of Residence									
Liberal		.024		.003		-.033		.060	
Intermediate		-.021		-.026		.011		.100·	
Conservative		.000		.000		.000		.000	
Family Planning Needs									
High Unmet Need		-.014	-.016	.006	.023	-.050	-.034	.059	.095·
Medium		-.013	-.023	.027	.052·	.052	.011	.097·	.089*
Low Unmet Need		.000	.000	.000	.000	.000	.000	.000	.000
R^2		.05	.04	.09	.07	.11	.10	.11	.09
Corrected R^2		.01	.01	.06	.05	.08	.08	.07	.06
F		1.39	1.64	3.04	3.64	3.88	5.21	2.70	3.28
N		(891)		(906)		(1105)		(650)	

\+ Sample size too small to calculate probabilities.

* Beta ≥ 2 x its standard error

· Beta < 2 but ≥ 1.5 its standard error

Note: This table is repeated with standard errors added in Appendix Table 6.

FIGURE 8: Annual Probabilities of Pregnancy to Non-Virgins, by Age (White Females)

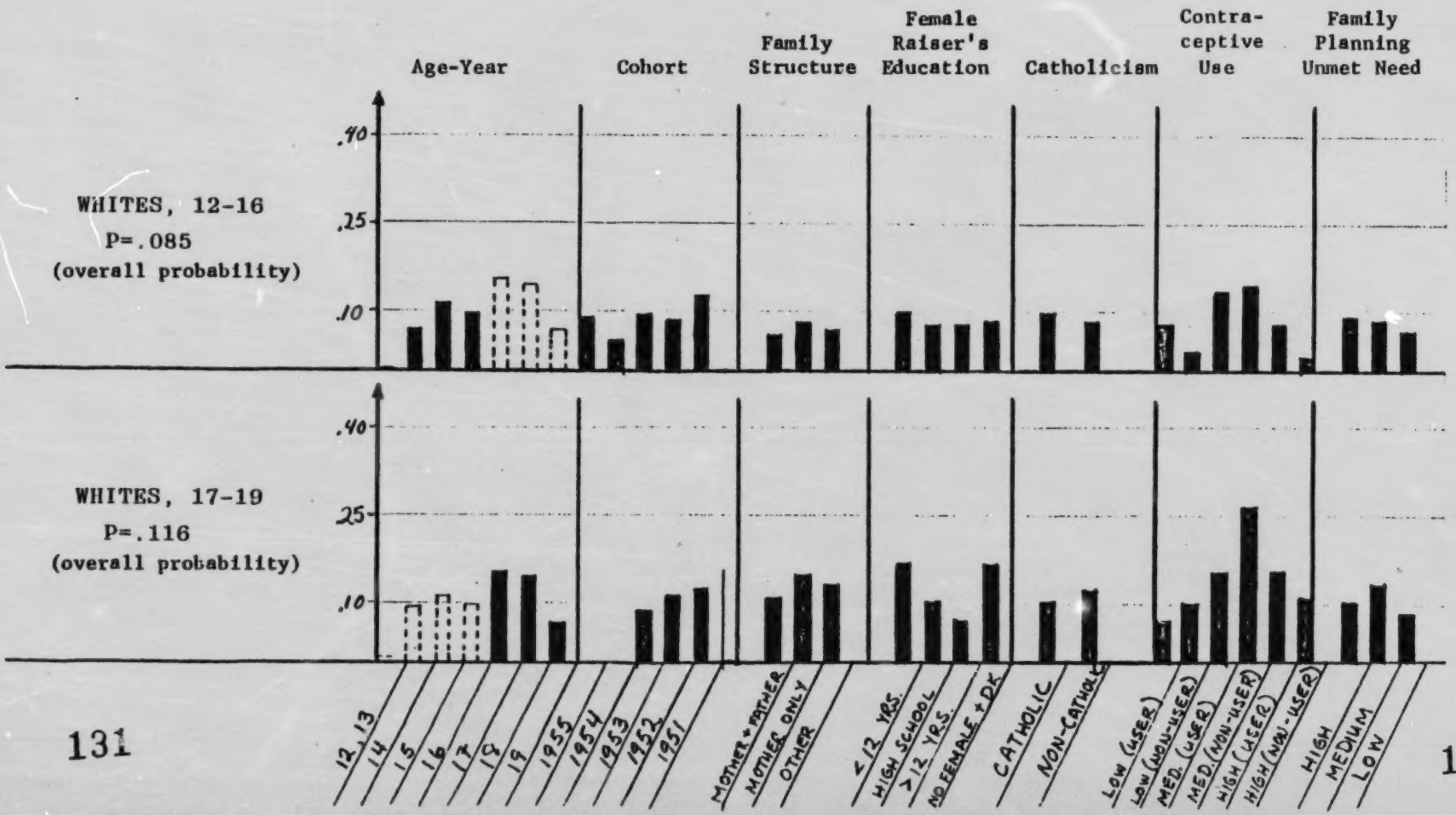
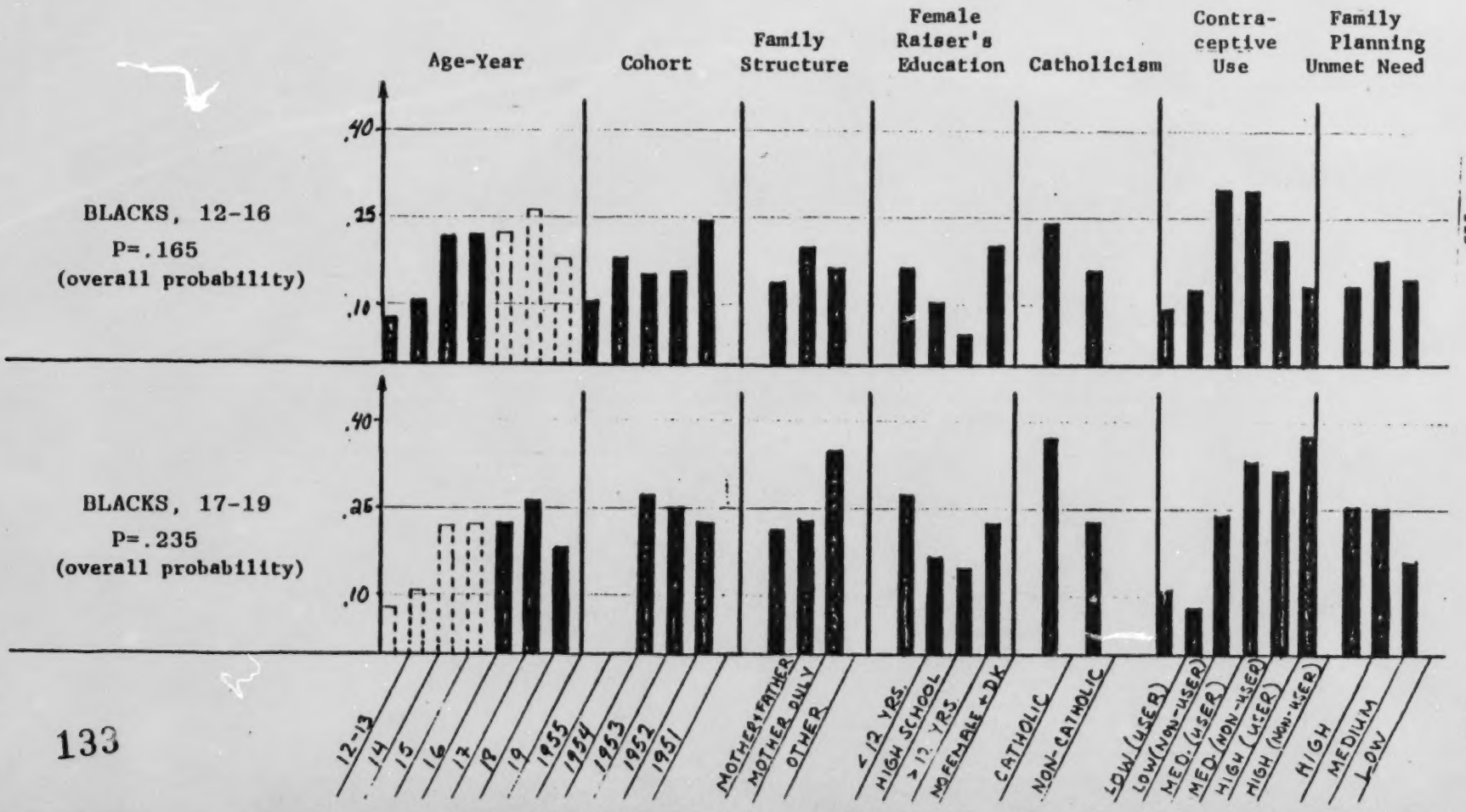


FIGURE 9: Annual Probabilities of Pregnancy to Non-Virgins, by Age (Black Females)



replicated among the other sub-groups, but it is possible that older blacks, given frequently lower incomes,might be somewhat overly represented among users of subsidized family planning services and thus more affected by its availability than whites. It is important to note that although family planning availability is not related to a higher incidence of sexual activity -- a common accusation -- it does seem to be related to a lower incidence of conception, at least among older black teenagers.

Although urban/rural residence was thought to affect the availability of contraceptive services, no support for this hypothesis was found. The probability of pregnancy, given sexual experience, is somewhat lower in suburbs, however.

The cost and availability of contraception was presumed to be related to contraceptive use. Unfortunately, detailed information on contraceptive use from the survey were not released for this analysis, and the only measure available is whether the respondent "sometimes, always, or never" used contraception. Since few respondents remained in the "always" category after two years of exposure to intercourse, the categories "always" and "sometimes" were combined. In addition, the factor of duration of exposure (years since first intercourse) was included in order to separate women who have never used contraceptives over several years of exposure from women who have never used contraceptives but who have only been exposed for a short time. The results are complicated but interesting.

The most consistent tendency is for the incidence of pregnancy to be highest among young women who have engaged in sexual intercourse for a "medium" length of time; although among older black teens, those in the high duration group have the greatest probability. Among these women, the incidence of pregnancy is lower for older teens who have ever used contraception, but does not vary much among the younger teens. Among the low duration sub-group, the likelihood of pregnancy is not consistently related to contraceptive use. Perhaps in some cases, the measure of contraceptive use is a proxy for intercourse frequency, so that

frequent intercourse is paired with some contraceptive effort, and the two effects tend to cancel one another out.

The data for the high duration category are rather intriguing. Except among older blacks, the incidence of pregnancy is actually lower among those teenagers not using contraception. This sub-group finding probably represents the effect of subfecundity on conception. Many of the fecund probably become pregnant and are then eliminated from the sample. (Of course, incomplete reporting might also be a factor, though it seems unlikely that this group would be particularly prone to "forget" to report pregnancies.) Thus we find that the likelihood of pregnancy, given sexual activity, increases from a brief to a medium duration of such activity and then tends to fall as, presumably, the more fecund young women do become pregnant and leave the eligible population.

Since pregnancy rates are higher among contraceptors in five of twelve duration-specific comparisons and virtually the same in a sixth, it would appear that such a crude measure of contraceptive use is little more than an indicator of relatively frequent sexual activity. Use of contraception does not appear to be sufficiently efficacious or pervasive among this age group to greatly affect pregnancy rates. Clearly, there is room both for analyses using better data and for better use of contraceptives among adolescents.

Knowledge of how to prevent conception is measured by several variables. Birth cohort is included in the expectation that more recent cohorts have had better methods of contraception available to them. Although the probability of pregnancy seems slightly lower among more recent cohorts, the tendency is not regular. Indeed, among older blacks, more recent cohorts have a higher probability of pregnancy.

The education of the female raiser was also argued to affect the probability of conception, since girls with better-educated female raisers should be more

knowledgeable about sex, reproduction, and contraception. Indeed, the likelihood of conception is lower for teenagers with better-educated female raisers. This variable does not seem to be a proxy for social class, since the education of the male raiser was not found to be related to pregnancy. In addition, the probability of pregnancy is consistently highest when there is no female raiser or the respondent is not aware of the educational attainment of the person designated as her female raiser. Presumably, knowledge about sex reduces the likelihood of conception among sexually experienced teenagers.

Another factor believed to affect contraceptive use is religion. In addition to finding Catholics to have a slightly, though non-significantly, higher probability of being sexually active, we find black Catholics to have significantly higher pregnancy rates. Respondents' evaluation of the importance of religion to them also bears a slight relationship, those females having a more secular orientation reporting fewer pregnancies, except for older black teenagers.

Hypotheses about the impact of the availability of abortion in reducing the motivation to avoid conception generally did not receive support.

Respondent age was included in the analysis as a factor affecting fecundity. Since the sample for this stage of the analysis includes only those young women who have had sexual intercourse, it is not surprising that there is no monotonic age trend comparable to that found in the analysis of the transition to sexual activity. Very young females have a low probability of conceiving, presumably because they are not yet fully fecund (see page 38) and possibly because their intercourse frequency is lower than among older females. After most of the females are fecund, the proportion conceiving does not increase any further. (The reason for a falling conception probability among 19 year-olds is presumably the fact that this age-year does not represent a full-year's exposure, since interviewing took place in the spring.)

Frequency of sexual activity also seems likely to affect conception. Although

no direct measure is available, several proxies were included. Cohort variations, as noted above, are not regular. Family structure, on the other hand, does seem to be related to the likelihood of pregnancy. In every instance, females who lived in intact family environments when they were aged 10 to 15 are found to have lower probabilities of pregnancy, especially older blacks. This might be related to greater supervision and thus less frequent intercourse for the adolescent, or possibly to the correlation of family structure with family income.

One variable that has not yet been explicitly discussed in this section is that of the respondent's race. Blacks are consistently more likely to become pregnant, even comparing only whites who are sexually active with blacks who are sexually active. Comparison of Figure 8 with Figure 9 demonstrates the higher probability of pregnancy among blacks in virtually every sub-category. None of these independent variables seems to really explain the higher incidence of pregnancy among blacks. Since there is no reason to believe that blacks are more fecund than whites (see page 35) or that a higher proportion of blacks desire pregnancy, [95] it is not possible to explain the difference at this time. Better data on socio-economic status and frequency of contraceptive use might reveal race differences that explain the high rate of pregnancy among blacks.

In summary, the probability of pregnancy among sexually-experienced teenagers seems to be highest among blacks, among females with relatively poorly-educated mothers, among those who are aged fifteen and older, among those who are from non-intact families, and among black Catholics. Teenagers who consider their religion to be important to them, less recent age cohorts, and older teens living in states with high unmet need for family planning services are slightly more likely to become pregnant. Longer exposure to sexual intercourse also results in higher conception probabilities. The impact of contraceptive use would be clearer if more detailed information were available, but the impact appears to be small. This suggests, of course, that adolescent use of contraceptives is

sporadic and ineffective, a conclusion supported by other researchers working in the area.[96/]

3. The Transition to An Out-of-Wedlock Birth

The number of young women eligible for this stage of the analysis is considerably smaller than the number in the initial sample. Of the 4,611 teenagers interviewed by Kantner and Zelnik, 624 became pregnant, and 520 of these represent premarital conceptions. Because of the diminished sample size, separate analyses were not conducted within separate age and race groups but on the entire sample of pregnant females. This stage of the analysis is also different because coefficients represent simple probabilities rather than annual probabilities, because, of course, the outcome of a conception is a concrete event that must occur within a delimited period of time.

Although the outcome of greatest interest is the birth that occurs out of wedlock, parallel analyses were conducted on the same sample of premaritally pregnant teenagers to permit joint exploration of two other possible outcomes -- abortion to end the pregnancy and marriage to legitimate the pregnancy. (Females reporting miscarriages were dropped from the sample after no patterns in the occurrence of this outcome were detected.) All three dependent variables are dichotomous:

Out-of-wedlock birth	1 = Live birth to unmarried female 0 = All other outcomes
Marriage	1 = Marriage before outcome of pregnancy 0 = All other outcomes
Abortion	1 = Pregnancy terminated by abortion 0 = All other outcomes

Clearly, these are not independent analyses. Their value lies rather in their ability to supplement one another.

One shortcoming of the analysis lies in the fact that the data were collected before abortion was legalized nationwide. However, abortion was legal in some states, a fact which provides some interesting variations to be explored.

Variables included in the initial and final regressions for this analysis stage are listed in Table 40. The regression coefficients are reported in Table 41, and the calculated probabilities portraying the likelihood of abortion, legitimating marriage and o-w birth are protrayed in Figure 10.

Several measures of the motivation to avoid childbearing were included in the analysis. An important variable for the family planner, policy maker, and educator to keep in mind is the "Desire" measure ("Did you want to become pregnant..?). Although only a minority of this age group wish to become pregnant, those who do show strikingly different outcome patterns. First, only four percent have abortions, compared to almost twenty percent for the rest of the sample. Correspondingly, a high proportion carry the pregnancy to term either within or outside of marriage. Most notable is the extremely high frequency of marriage before birth among those young women who desired their pregnancy. Over half marry, which suggests the possibility that the desire to force a marriage provided a motivation for the pregnancy.

The impact of governmental policies on the motivation for pregnancy and thus on pregnancy outcome is a critical concern. This stage is the one at which careful planning and decision-making might be most likely to occur, and therefore it seems reasonable that this is the stage in the process of becoming a parent out of wedlock at which policy variables would have the greatest impact. What is the impact of government policy on pregnancy outcome?

Two measures of welfare availability were studied. The first measure is the 1971 AFDC benefit level in the state of residence as a proportion of the 1969 median family income in the state. It appears that where the AFDC benefit level

Table 40 : Independent Variables Used in the Micro Analysis of Pregnancy Outcomes

Theoretical Determinants	Variables Used as Proxies in Initial Regression	Variables Retained in Final Regression
Probability of Abortion		
Motivation to avoid childbearing	Desired child	Desired child
	AFDC benefits	AFDC benefits
	AFDC acceptance rates	Education of father or male raiser
	Education of father or male raiser	
Cost and availability of legal abortion	Period	Period
	Abortion availability in state of residence	Abortion availability in state of residence
Attitudes toward abortion	Religiosity	
	Whether Catholic	
Spontaneous abortion*		
Probability of Marriage		
Relative economic benefits of marriage	AFDC benefits	AFDC benefits
	AFDC acceptance rates	AFDC-UF availability
	AFDC-UF availability	
Sex ratio		
Miscellaneous	Race	Race
	Age	Age
	Residence	
	Structure of family of origin	

* Women having spontaneous abortions were excluded from the sample for this stage.

TABLE 41 : Pregnancy Outcome -- Regression Coefficients (Analysis of Micro Data File: Females 15-19 in 1971)

	Abortion		Marriage		Out-of-Wedlock Birth	
	Rgr. 1	Rgr. 2	Rgr. 1	Rgr. 2	Rgr. 1	Rgr. 2
Age - Year						
12-14	.000	.000	.000	.000	.000	.000
15	.001	-.011	-.034	.027	-.012	-.011
16	-.093	-.112	-.088	.034	.191*	.189*
17	-.072	-.105	-.134	-.028	.194*	.226*
18	.007	-.015	-.068	.024	.058	.072
19	.245*	.233*	-.136	-.059	-.085	-.087
Race						
White	.119*	.128*	.422*	.411*	-.529*	-.516*
Black	.000	.000	.000	.000	.000	.000
Period						
1970-71	.024	.107*	.238*	-.023	-.001	-.058
1969	-.111	.000	.281*	.000	.094	.000
1968	-.048		.389*		-.057	
Before 1968	.000		.000		.000	
Residence						
Central City	-.040		.067		.103	
Suburb	.047		.076		.034	
Non-SMSA/Non-farm	-.040		.003		.189*	
Farm	.000		.000		.000	
Family Structure When Respondent Aged 10-15						
Mother and Father	-.007		.010		-.043	
Mother only	-.016		.007		.005	
Other	.000		.000		.000	
Education of Father or Male Raiser						
< High School	.029		.004		-.002	
High School	.051		.002		.013	
Other	.000	.000	.000	.000	.000	.000
College Education	.269*	.226*	-.090	-.089	-.154*	-.143*
Whether Catholic						
Catholic	.018		-.034		.065	
Non-Catholic	.000		.000		.000	
Whether Catholic & White						
Catholic & White	-.021		.030		-.030	
Not Catholic & White	.000		.000		.000	
Importance of Religion to Respondent (continuous variable: higher number = more secular	.063*	.055*	-.033	-.023	-.033	-.024

	Abortion		Marriage		Out-of-Wedlock Birth	
Desired Child						
Desired	-.164*	-.156*	.292*	.281*	-.093*	-.098*
Not Desired	.000	.000	.000	.000	.000	.000
Unemployed Father Program						
Exists in home state	.106	.116	.030	.016	-.093·	-.113*
Does not exist in home state	.000	.000	.000	.000	.000	.000
Abortion Availability in State of Residence						
Liberal	.112*	.175*	-.080	-.059	.002	-.092·
Intermediate	.164*	.158*	-.062	-.042	-.123*	-.113*
Conservative	.000	.000	.000	.000	.000	.000
AFDC Benefits Relative to Median Income in Respondent's State						
.23 (Low)	.088·	.071·	-.067	-.065	-.068	-.009
.24 - .30 (Medium)	.137*	.114*	-.109·	-.094·	-.108·	-.057
.31 (High)	.000	.000	.000	.000	.000	.000
AFDC Acceptance Rate						
.50 (Low)	-.081·		.030		.140*	
.51 - .74 (Medium)	-.023		.059		.014	
.75 (High)	.000		.000		.000	
R^2	.290	.273	.298	.270	.376	.349
Corrected R^2	.241	.247	.249	.244	.333	.325
F =	10.49		10.32		14.90	

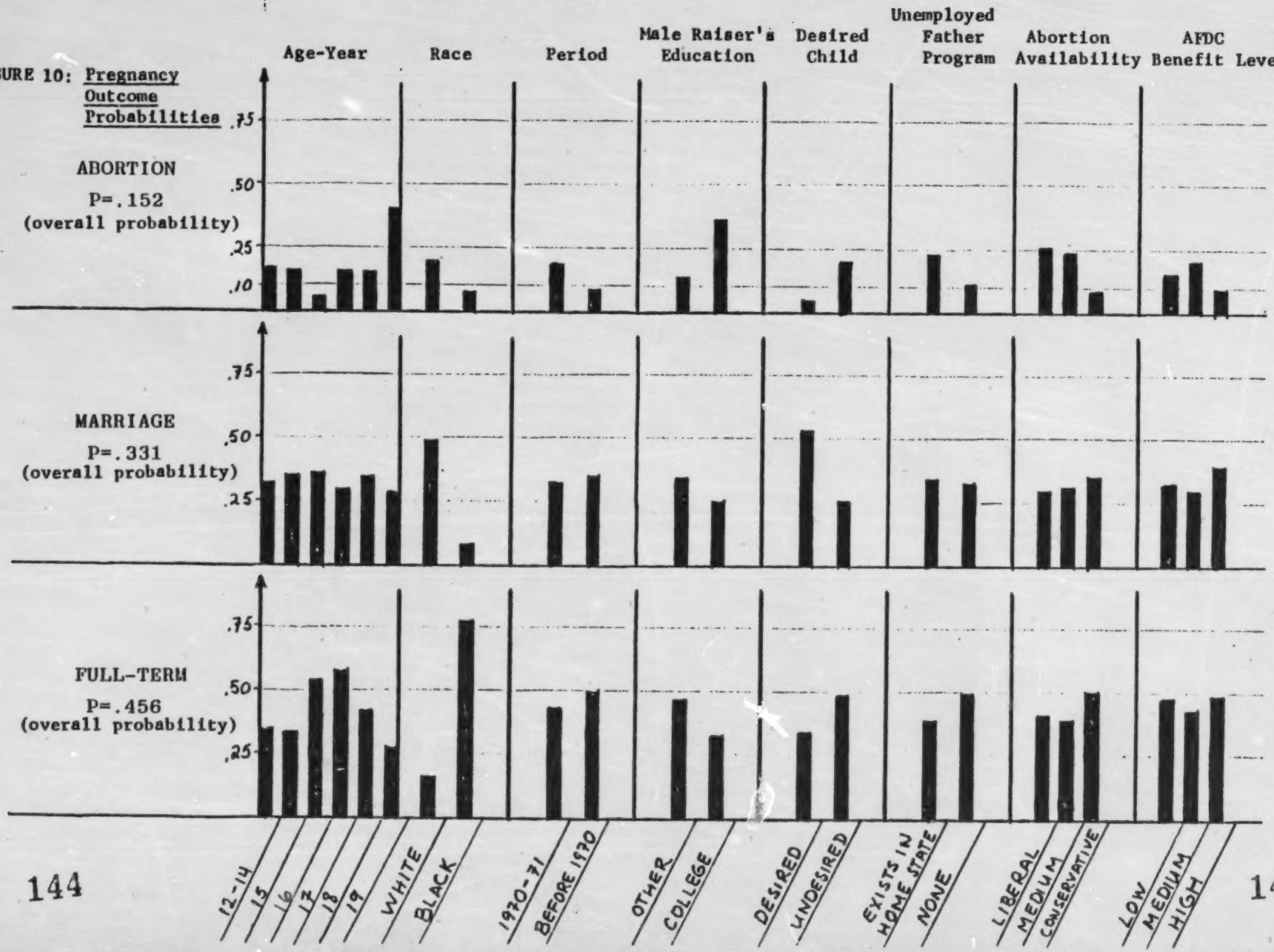
N = 520

Note: This table is repeated with standard errors added in Appendix Table 7.

* = Beta ≥ 2 times its standard error

· = Beta = 1.5-2 times its standard error

FIGURE 10: Pregnancy Outcome Probabilities



is relatively low, the probability of abortion is significantly higher; the probability of marriage to legitimate pregnancy and the probability of having a child out of wedlock are both slightly lower. Thus, a slight but statistically non-significant relationship exists between AFDC benefits and the likelihood of a pregnant teenager ending her pregnancy with an out-of-wedlock birth. On the other hand, the AFDC acceptance rate was found to be negatively related to pregnancy outcome. Indeed, states with high acceptance rates were found to have a significantly lower proportion of o-w births. There is, then, no statistically significant positive association between welfare and carrying an o-w pregnancy to an o-w birth.

The availability of legal abortion seems likely, as argued earlier (see pages 59 - 67), to have an important impact on pregnancy outcome, and the magnitude of its impact is indeed great. It outweighs all other variables, except for respondent race and whether the pregnancy was desired. Even in a 1971 data set, the impact of change over time can be noted. The variable "Period" compares the outcome of pregnancies that occurred before 1970 with pregnancies occurring in 1970 and 1971. The abortion outcome is twice as frequent in the later time period, and there is about a six percent decline in the proportion of pregnancies that terminate in a live birth. There is also a slight decline in the proportion of pregnant teenagers who marry, but this change seems to be outweighed by the impact of abortion; together these factors result in a lower probability of a live o-w birth. Since these data are somewhat out-of-date, it is important to conduct a comparable analysis on a more current data base. The importance of change over time in laws regarding abortion is further emphasized, however, by another variable added on to the current data set.

Respondents were assigned a code for the kind of 1971 abortion law existing in their state of residence. Clearly an abortion outcome was much more frequently

reported by females residing in states where abortion was legal and available, defined as "liberal," and in states where abortior was somewhat restricted but fairly available (if only by virtue of geographic propinquity to a state in which abortion was easily available), defined as "medium." The impact of a high rate of abortion is felt on both the marriage and the out-of-wedlock variables. Apparently, abortion availability somewhat reduces the probability of a forced marriage and has a considerable impact in reducing the probability of an o-w birth.

Given the official Catholic stance opposing abortion, it seems surprising that the variable for Catholic affiliation did not significantly affect the pregnancy outcome. Religiosity does have some impact, however. Respondents stating that their religion is important to them are significantly less likely to have abortions and more likely to either marry or have the birth out of wedlock.

No significant association between pregnancy outcome and living in an intact family at ages 10 to 15 was found. In addition, the education of the male raiser is not monotonically related to pregnancy outcome. The only category that seems to make a difference is that of the college-educated male raiser. Young women with highly educated male raisers are considerably more likely to obtain abortions. They are correspondingly less likely to marry and less likely to deliver an out-of-wedlock child. This finding probably represents the motivation and ability of these families to prevent an o-w conception from having long-term undesirable consequences on the young women's life experience. (One would also expect that many of the babies that are adopted out by the mother come from this group of births.)

Several governmental policies were noted as possible influences on the probability of marriage to legitimate an o-w pregnancy. As reported above,

high AFDC benefit levels are associated with low abortion rates but also with high marriage rates and not with a significantly greater incidence of o-w childbearing. And, as noted, AFDC acceptance rates are actually negatively associated with the probability of an o-w birth.

AFDC coverage of unemployed fathers seems to be a program with rather direct relevance to the probability of marriage among many couples faced with a premarital pregnancy. Young women residing in states with such a program do have a slightly higher probability of marriage...but a considerably higher probability of abortion as well. Consequently, presence of an unemployed father program is associated with a significantly lower incidence of o-w childbearing. One would expect more marriages in the presence of such a program because it allows young couples to marry and receive AFDC payments if the father is unemployed. The higher incidence of abortion was not predicted and may well be an artifact of a joint occurrence of liberal abortion policies and AFDC coverage of unemployed fathers.

The association between the age of the pregnant young woman and the outcome of the pregnancy is not monotonic. Though the abortion outcome is most common among the very oldest teenagers, the probability of marriage is not associated with age in any interpretable manner. The probability of bearing a child out of wedlock seems to rise with age but then falls among the very oldest age group, presumably because of the high incidence of abortion among these young women. It is interesting that the impact of age disappears when considering the outcome of pregnancy. Apparently, once a young woman is pregnant, factors other than her age are related to the outcome of the pregnancy.

Since this analysis was conducted on the entire eligible sample, a coefficient for respondent race appears for the first time. The magnitude of the differences captured by this variable dwarf all of the other independent variables. Blacks are considerably less likely than whites to obtain an

abortion. In addition, blacks are much less likely to marry before the birth, and thus, not surprisingly, a markedly greater proportion of black teenagers end up delivering their pregnancy outside of marriage.

To summarize these findings, it appears that the probability of abortion among premaritally pregnant teenagers is highest among whites, among females with college-educated fathers, and among females living in states with relatively liberal abortion policies. Pregnancies occurring after 1970 were more likely to be terminated by abortion than pregnancies occurring during earlier years, while pregnancies that were desired by the mother were more likely to lead to a legitimating marriage. Welfare policies do not seem to be an important influence on the probability of o-w childbearing. AFDC coverage for unemployed fathers is associated with a lower probability of delivering a child out-of-wedlock, but primarily, it would appear, because of its association with a higher probability of abortion. The probability of carrying the pregnancy to term without marriage is highest among blacks, among females raised by a male without a college education, among females living in states with conservative abortion laws, among females who desired their pregnancy, and among females whose pregnancy outcome occurred before 1970.

F. Results from the Macro Analysis: 1974 Out-of-Wedlock Birth Rates by State

The macro, or state, analysis constitutes a completely different approach to the study of out-of-wedlock fertility, compared to the micro analysis. All variables are measured on a state basis, though whenever possible they are age-, race-, and sex-specific. Since there are only 51 states, including the District of Columbia, the sample size is small and this fact limits the number of variables that can be included in an equation. However, because o-w fertility was measured for 1974, the use of this data set permits study of o-w fertility after the landmark Supreme Court decision legalizing abortion.

Results for this analysis are presented in Table 43. After specifying the theoretical model and operationalizing hypotheses with the best data available, as indicated in Table 43, the variables were allowed to run in stepwise regressions against the o-w birth rate for white and black women aged 15-19, 20-24 and 15-44. (Results will not be reported for the under 15 group because the small size of the data base prohibited running a full set of variables.)

Viewing these results against the theoretical expectations outlined in an earlier section of this chapter, summarized in Table 42, we find that few state level variables are related to out-of-wedlock fertility rates.

Two measures of attitudes and social controls were included in this macro data set -- the proportion of each state that is urban and the proportion of the state that is Catholic. The percent of the state population residing in SMSAs is negatively related to o-w fertility in five of six sub-groups, but the association is at most marginally significant. The proportion of the state that is Catholic is positively associated with the o-w birth rates of blacks, though not of whites. Since few blacks are themselves Catholic (see A-11 in Appendix Table 2), this difference may reflect a climate of social opinion or availability of birth control, sex education, or abortion that affects blacks. These kinds of variables are difficult to interpret in a macro data set. Of course, as

TABLE 42 : Independent Variables Used in the Macro Analysis of Out-of-Wedlock Birth Rates

Transition Stage	Theoretical Determinants	Variables Used As Proxies	Expected Effect of Variable on Sex, Pregnancy, Abortion or Marriage
1. Sexual Activity	Biological and Social Maturity	Age*	
	Attitudes and the Strength of Social Controls	Percent Urban	+
		Percent Catholic	-
	Motivation to Avoid Pregnancy and Child-bearing	Female earnings	-
		Percentage of females employed	-
		AFDC level of benefits	+
		AFDC acceptance rate	+
		Unborn child coverage	+
		Educational expenditures	-
		Median educational attainment of females 20-24 years old	-
	Availability and Cost of Contraception and Abortion	Family planning services	+
		Age of consent for contraception	-
		Abortion availability	+
		Medicaid Abortion Coverage	+
		Age of Consent for Abortion	-
2. Pregnancy Among the Sexually Active	Motivation to Avoid Pregnancy and Child-bearing	Female earnings	-
		Percentage of females employed	-
		AFDC level of benefits	+
		AFDC acceptance rate	+
		Unborn child coverage	+
		Percent Catholic	+
		Median educational attainment of females 20-24 years old	-
	Cost and Availability of Contraceptive Services	Family planning services	-
		Age of consent for contraception	+
	Knowledge of How to Prevent Conception	Median educational attainment for females 20-24 years old	-
	Cost and Availability of Abortion	Abortion availability	+
		Medicaid coverage of abortion	+
		Age of consent for abortion	-
	Fecundity	Age*	
3a. Probability of Abortion Among Pregnant Women	Motivation to Avoid Child-bearing	Female earnings	+
		Percentage of females employed	+
		AFDC level of benefits	-
		AFDC acceptance rate	-
		Unborn child coverage	-
		Percent Catholic	-
		Median educational attainment of females 20-24 years old by race	+
	Cost and Availability of Legal Abortion	Abortion availability	+
		Medicaid Coverage of Abortion	+
		Age of consent for abortion	-
3b. Probability of Marriage Among Pregnant Women	Desirability or Feasibility of Marriage	AFDC level of benefits	-
		Ratio of female/male earnings	-
		AFDC acceptance rate	-
		AFDC-unemployed father program	+

*Not used as an independent variable but analysis disaggregated by age.

TABLE 43: Regression Coefficients for Macro (State Level) Analysis of 1974 Out-of-Wedlock Birth Rates, by Age

	White			Black		
Age =	15 - 19	20 - 24	15 - 44	15 - 19	20 - 24	15 - 44
Mean Rate of OW births (states in final regression) = 11.4		18.5	12.7	111.6	154.4	105.7
AFDC Benefit Level	-0.07	-0.09	-0.05	-1.10*	-0.85	-0.19
AFDC Acceptance Rate	a	-	0.02	-0.42	0.16	-0.18
Abortion Availability (1-Very; 2-Somewhat; 3-Not very available)	-1.92*	-4.26*	-2.24·	-	13.84	3.82
Family Planning Patients per 1000 Women in Need	0.02	0.11	0.05	-0.83*	-1.33	-0.48
Unemployed Father Program-dummy variable, 1 = UF Program	0.89	0.93	0.62	19.5·	17.13	6.18
Unborn Child Coverage-dummy variable, 1 1 = Program	-0.27	-	-0.45	2.09	3.24	-2.52
Medicaid Abortion Coverage-dummy variable, 1 = Not Covered	1.59	3.11	2.41·	-6.83	-	-1.66
Age of Consent/Contraception dummy variable, 1 = 18+	-0.34	inap.	inap.	19.36*	inap.	inap.
Age of Consent/Abortion dummy variable, 1 = 18+	0.82	inap.	inap.	-8.40	inap.	inap.
Median Education Attainment for Females 20-24, by Race	a	0.29	-	0.27	-4.65	-0.55
Percent of Total Work Force Unemployed	0.05	0.10	0.04	-0.60*	-	-
Percent Females Age 25-34 Employed, by Race	-0.16	-0.62·	-0.23	-	-2.01	1.74
Female Earnings, by Race	-	-0.00	-0.00	0.02*	0.01	0.01
Female/Male Earnings Ratio, by Race	0.09	-	-	0.31	1.77·	-0.55
Percent of state in SMSAs	-0.04·	-0.08·	-0.04	-0.20	0.59	-0.31
Percent of state Catholic	-0.03	-0.13	-0.03	0.58·	0.34	0.76*
R^2	0.42	0.39	0.30	0.58	0.39	0.39
F	1.69	1.84	1.13	2.00	1.17	1.02

* = beta ≥ 2 x its standard error;
· = beta > 1.5 but < 2 its standard error; - = variable never entered regression;
inap. = variable inappropriate for population age-group and therefore omitted;
a = these variables too highly correlated in this age group with family planning variable, so they were dropped. None of the 3 variables is significantly related to o-w rates, nor are other coefficients affected by use of 1 variable rather than another.

already reported, black Catholics were found to have a higher probability of pregnancy in the micro analysis. Whether just black Catholics or blacks in Catholic states account for the association is not known.

Several variables measuring motivation to avoid pregnancy and childbearing were included in the macro data file. Female labor market opportunities, as measured by the proportion of women aged 25 to 34, by race, who are employed full-time, tend to be negatively but non-significantly related to the o-w birth rate. A second measure, the annual earnings of women employed full-time, by race, is only related to o-w birth rates among black teenagers, and the association is positive. Unless high wages discourage marriage among pregnant black teens, this association is probably due to an uncontrolled variable (such as liberality of the social climate), which increases both black wages and o-w birth rates.

Another alternative to childbearing is education. However, neither state expenditures on post-secondary education nor spending on vocational education merited a place in the final equations. Individual-level measures of actual availability of educational opportunities, plus interest in education, would better tap this theoretical construct.

The several welfare programs that were hypothesized to encourage o-w childbearing -- state AFDC benefits, acceptance rates and coverage of the unborn child -- were not found to be significantly associated with o-w birth rates. The only significant association is a <u>negative</u> relationship between the o-w birth rate among black females aged 15 to 19 and the state AFDC benefit level. None of these aggregate level measures of motivation to avoid childbearing, then, seem to affect the o-w birth rate.

The impact of the contraception/abortion environment on o-w fertility is an intriguing question. Abortion availability was measured on a three-point ordinal scale, rather than with the abortion rate, because the abortion rate is confounded

by the demand for as well as the availability of abortion. For example, the number of abortions per 1,000 women can be affected by the level of sexual activity, the proportion of the population that is single, and the availability of contraception. In addition, the rate is not age- or race-specific, so important state sub-group differences may be concealed. The abortion availability measure is constructed from data on the abortion rate, abortion ratio, legal restrictions of abortion, and length of time since abortion was legalized. States falling into each category are reported in Appendix Table 3.

The availability of abortion is negatively related to the o-w birth rates of whites, but not of blacks. The coefficient is largest among white females in their early twenties, an age group that obtained nearly a third of the abortions performed in the United States in 1974. Apparently the high incidence of abortion has had some impact on the o-w fertility rates of whites. Why not blacks? We know for a fact (a rare circumstance in social science research) that abortions occur that prevent o-w births from taking place, since 70 percent of all abortions are obtained by unmarried women. The failure of the abortion availability variable to uncover any impact among blacks may be due to the lack of race-specific data on abortion. Documenting the true, net effect of abortion availability requires controlling for marital status, sexual activity, and the frequency of pregnancy among the unmarried -- as was attempted in the micro analysis. As already reported, older black teenagers in states with liberal abortion policies were found to have higher, though marginally significant, frequencies of sexual activity and of pregnancy among the sexually active. Such tendencies might offset the dampening impact of abortion on o-w childbearing, so that no overall association appears. We wish to emphasize, however, that it is

not necessarily true that liberal abortion policies encourage sexual activity or pregnancy; indeed, the existence of such policies may be a response to high levels of sexual activity and pregnancy.

Another measure of abortion availability is the coverage of abortion procedures under a state's Medicaid program. Out-of-wedlock fertility is higher among whites in states without such coverage, although the association is not statistically reliable. On the other hand, the association is negative and non-significant in the two black equations in which it appears: the variable did not ever enter the stepwise regression for blacks aged 20 to 24. Thus, it is possible that absence of Medicaid coverage of abortion is related to higher white o-w birth rates, but the absence of a strong association would suggest that other factors are at work. In addition, existence of a law establishing 18 as the legal age of consent for abortion is not associated with the o-w birth rates of adolescents.

The measure of the availability of family planning services (family planning patients in subsidized programs per 1,000 women in need of services) is related to a lower incidence of o-w childbearing among blacks, a finding which reaches significance among teenage blacks but is not replicated among whites. This corresponds to recent research by Cutright and Jaffee, in which the effect of family planning program enrollment was found to be stronger for blacks than for whites and stronger for poorer people than for more affluent people.[97/] This also corresponds to the finding reported earlier (pages 110 & 116) indicating that family planning availability is related to a lower probability of conception among sexually active older black teenagers. In addition, states with a legal age of consent of 18 or older have significantly more black teenage o-w births -- 19 more births per 1,000 unmarried black females aged 15 to 19. Taken as a whole, these findings constitute impressive evidence of the impact of family planning pro-

grams on fertility rates, especially among blacks and/or poor people. They corroborate indications that previously high levels of childbearing have been swelled by unwanted or unintended births, and that when services are made available, they are used and have an impact on fertility rates.

Median educational attainment was included in the equation as a measure of a higher degree of information about sex, reproduction, and contraception. However, no association between the median education of females 20 to 24, by race, and the rate of o-w births was discovered.

Variables added to the model in the expectation that they might affect the outcome of a premarital pregnancy include influences on abortion, on marriage, and on a woman's ability to support herself outside of marriage. As noted earlier, the measures of female earnings and the percent of females employed are not significantly related to o-w childbearing. The ratio of female to male earnings is positively related to the o-w birth rate among black females aged 20 to 24, but not among the other sub-groups. From a similar perspective, it would seem that a high unemployment rate would inhibit marriage and be associated with a high o-w birth rate, but this was not found. The unemployment variable is not associated with o-w fertility rates, except for a negative association among black teenagers. This variable, unfortunately, is not race- or sex-specific. It seems likely that it is simply picking up the high rates of unemployment registered in those industrial states that suffered heavily because of the economic recession, several of which states are characterized for unknown reasons by relatively low rates of o-w childbearing.

The availability of AFDC support to families with an unemployed father was also not found to be associated with higher o-w fertility. Actually, the presence of an AFDC-UF program is consistently associated with higher o-w birth rates, though only once does the association even approach statistical significance. There

is no evidence in the macro analysis, then, that welfare programs act as incentives to the occurrence of childbearing outside of marriage. Overall, the only variable hypothesized to have an effect on the probability of marriage which actually seems to be important is the availability of abortion.*

In summary, we find that none of the welfare parameters are positively associated with the incidence of childbearing outside of marriage, nor do state level measures of the motivation for sex, pregnancy or childbearing seem to predict o-w fertility. Factors hypothesized to affect the probability of marriage on the aggregate level also fail to evidence any association. Family planning availability, measured as the proportion of those in need actually served and as the age of consent for contraception, predict low o-w birth rates among blacks; while the o-w birth rates of whites are lower when abortion is relatively available.

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* A final variable that was initially included in the state analysis is the sex ratio, the number of unmarried males aged 20-24 per 100 females, by race, in a state in 1970. Because this is such a poor measure of the availability of marriage partners, it was later dropped from the analysis. Despite the crudeness of the measure, a high ratio of males to females was found to be significantly related to lower o-w birth rates among blacks, suggesting that more marriages occur when males are in a relatively abundant supply. This factor might merit further study, especially given anecdotal evidence that many women who cannot marry simply have their children outside of marriage.

G. Sensitivity Analyses Based on the Micro Regression Output

One utility of the estimates developed in the micro regressions is that they provide the data to carry out "sensitivity analyses," a method of projecting populations under varying assumptions. In a sensitivity analysis, an initial population is aged under different circumstances to permit evaluation of the effects of the varying circumstances. For example, the effect on a population of young women of high pregnancy rates relative to low pregnancy rates can be compared. The initial population with high pregnancy rates might end up with, say, a third of the young women becoming pregnant by the time they are twenty, compared to only ten percent of the young women becoming pregnant in the low-pregnancy population. Similarly, the impact of high abortion rates versus low abortion rates can be compared, as can the impact of early versus later marriage, or early versus late transition into sexual activity.

In many ways, this analysis is similar to the calculations performed on the basis of the accounting model estimates in Chapter III. The difference is that the sensitivity analyses are considerably more detailed. Whereas in the accounting model approach the flow essentially proceeds in only one direction, in the sensitivity model there are multiple initial states and multiple outcome states.

All sensitivity analyses are performed by taking a cohort of 10,000 females on their twelfth birthday and moving them ahead one year at a time for eight years (or until they reach their twentieth birthday), among eight possible states:

(1) single and a virgin
(2) single and a non-virgin
(3) in first marriage, never pregnant prior to marriage
(4) single pregnant
(5) marriage as the outcome of first pregnancy
(6) abortion as the outcome of first pregnancy
(7) miscarriage as the outcome of first pregnancy
(8) out-of-wedlock birth as the outcome of first pregnancy

We assume all females begin as single (never-married) virgins on their twelfth birthday. (Although this assumption is not precisely correct, in fact the results are not at all sensitive to reasonable changes in this assumption.) As she "ages," each female, depending on her current status, is exposed to the relevant processes from among (1) sex, (2) marriage-before pregnancy, (3) pregnancy, and (4) pregnancy outcome (i.e., marriage before any other outcome, abortion, miscarriage, or birth). The four pregnancy outcomes are "absorbing" states; once entered, the states cannot be left. The state "in first marriage, not pregnant prior to marriage" is also absorbing. Exits are made only from the states 'single virgin,' 'single non-virgin,' and 'single pregnant.' The state 'single pregnant' is emptied each year; we assume all pregnancies are resolved in the year. By these decisions we are in effect observing only first out-of-wedlock births to never-married females. Second and higher order births, or out-of-wedlock births to previously married females are not observed. As soon as a female either becomes married or has her first premarital pregnancy resolved, our interest in her subsequent behavior ceases. As long as this definition in the scope of our interest is kept in mind, it does not handicap the sensitivity analysis.

One value of this approach is that it provides an integrated picture of the overall process. Thus far, we have disaggregated the microanalysis into several component parts (transition to sexual activity, pregnancy and pregnancy outcome), and while there is enormous utility in doing the analysis in that fashion, it is also valuable to combine these several flows, in order to examine their combined effect, and the sensitivity analysis provides a means to do this.

Tables 44 and 45 bring together results previously presented in Figures 6

TABLE 44: Predicted Transition Probabilities Among Sex, First Marital and First Pregnancy Outcome Statuses (Derived From Final Regressions Estimated Using Kantner-Zelnik Data)

WHITE FEMALES

($\times 10^3$)

	AGE IN EXACTLY COMPLETED YEARS AT END OF TRANSITION							
	13	14	15	16	17	18	19	20
SEX: from virginity to non-virginity	8	11	21	41	84	130	192	250*
PREGNANCY: probability of single non-virgin becoming pregnant	0	0	68	112	90	63	156	146
MARRIAGE: probability of first marriage given not pregnant	1	5	12	32	64	110	170	200
MARRIAGE: given pregnant and single	480	480	480	507	514	434***	504	421
ABORTION: given pregnant and single	219	219	219	208	107	202***	204	452
**MISCARRIAGE: given pregnant and single (residual category)	148	148	148	143	37	0	67	61
OUT-OF-WEDLOCK BIRTH: given pregnant and single	153	153	153	142	342	364***	225	66

SOURCE: See Figures 6, 8, and 10.

* Rough extrapolations

** A pure residual; calculated by adding the transition probabilities for marriage, abortion and out-of-wedlock birth, then subtracting the sum from 1.0. The assumption is that these four events are exhaustive, as well as exclusive.

*** Adjusted downward proportionately so sum of pregnancy outcome categories = 1.0.

TABLE 45: Predicted Transition Probabilities Among Sex, First Marital and First Pregnancy Outcome Statuses (Derived From Final Regressions Estimated Using Kantner-Zelnik Data)

BLACK FEMALES

($\times 10^3$)

	AGE IN EXACTLY COMPLETED YEARS AT END OF TRANSITION							
	13	14	15	16	17	18	19	20
SEX: from virginity to non-virginity	25	35	70	148	255	354	401	450*
PREGNANCY: probability of single non-virgin becoming pregnant	76	76	109	193	196	226	266	179
MARRIAGE: probability of first marriage given not pregnant	1	10	20	40	73	105	130	150
MARRIAGE: given pregnant and single	69	69	69	96	103	40***	93	10
ABORTION: given pregnant and single	91	91	91	80	0	80***	76	324
**MISCARRIAGE: given pregnant and single (residual category)	171	171	171	166	39	0	90	84
OUT-OF-WEDLOCK BIRTH: given pregnant and single	669	669	669	658	858	880***	741	582

SOURCE: See Figures 7, 9, and 10

* Rough extrapolation
** See note on Table 44
*** Since sum > 1.0, all three were scaled down proportionately so that sum of pregnancy outcome categories = 0.

through 10.* As one might expect by now, the probability of first intercourse increases with age, as does the probability of marriage. The probability of premarital pregnancy rises, on the other hand, and then falls. The probability of beginning sexual activity and of becoming pregnant is higher for blacks, while the probability of obtaining an abortion or of marrying before birth is lower. And the probability of bearing a child outside of marriage is considerably higher for blacks.

Tables 46 and 47 are based on the last two tables. To generate the new tables, the probabilities from Tables 44 and 45 were applied to an initial population of 10,000 virgins, separately for each racial group, as the population was aged to the 20th birthday. The year-by-year distributions, along with cumulative totals, are reported by race. By the 20th birthday, we note that only 2341 (23.41 percent) of the whites are still single virgins; another 1715 are single non-virgins, and 4866 have entered into their first marriage prior to any pregnancy. 1062 have experienced pregnancies while single; of these, 495 married before any outcome, 278 obtained an abortion, 60 experienced a miscarriage, and 229 (2.29 percent) had an out-of-wedlock birth.

The number of out-of-wedlock births to black females is 2538, or over one-fourth of the initial group (ignoring, as we do throughout, mortality). The number for whites is less than one-tenth as many. All four processes contribute to this result. But the processes are not additive; we cannot simply "control" for one at a time and then add the results to account for the difference. The process is multiplicative in the sense that if any one of the crucial flows is low, it blocks the other

*The results were generated from the final regressions (those from which marginal variables had been dropped) predicting white and black transition probabilities by age for the processes of sex, pregnancy and pregnancy outcome (deriving miscarriage probabilities as the residual from marriage, abortion and birth). This was accomplished by adding the net effect of race to the net effect of age and adding the intercept. To these we added estimates of first marriage probabilities by race and age for non-pregnant females.

TABLE 46: Predicted Sexual, First Marital, First Pregnancy Outcome Histories of 10,000 Adolescent Females in the United States, by Age in Exactly Completed Years

White Females

FIRST MARRIAGE/FIRST PREGNANCY OUTCOME STATUS	AGE IN COMPLETED YEARS (EXACT)							
	13	14	15	16	17	18	19	20
SINGLE VIRGIN								
(-) to marriage not p.	10	50	117	302	561	826	989	780
(-) to single non-virgin	80	108	203	375	689	869	927	781
(=) remaining	9910	9752	9440	8763	7513	5818	3902	2341
SINGLE NON-VIRGIN								
(+) from single virgin	80	108	203	375	689	869	927	781
(-) to marriage, not p.	—	1	5	24	84	219	420	502
(-) to single pregnant	—	—	26	83	111	230	319	293
(=) remaining	80	187	359	627	1121	1541	1729	1715
cumulative ever s non-v	80	188	391	766	1455	2324	3251	4032
FIRST MARRIAGE, NOT PREG.								
(+) from single virgin	10	50	117	302	561	826	989	780
(+) from single non-v	—	1	5	24	84	291	420	502
(=) cumulative total	10	61	183	512	1130	2175	3584	4866
SINGLE PREGNANT								
(+) from single non-v	—	—	26	83	111	230	319	293
(=) ever single pregnant	—	—	26	109	220	450	769	1062
S. PREGNANT, MARRIAGE, OUT.								
(+) from single pregnant	—	—	12	42	57	100	161	123
(=) cumulative ever	—	—	12	54	111	211	372	495
S. PREGNANT, ABORTION								
(+) from single pregnant	—	—	6	17	12	46	65	132
(=) cumulative ever	—	—	6	23	35	81	146	278
S. PREGNANT, MISCARRIAGE								
(+) from single pregnant	—	—	4	12	4	0	21	19
(=) cumulative ever	—	—	4	16	20	20	41	60
S. PREGNANT, O-W BIRTH								
(+) from single pregnant	—	—	4	12	38	84	72	19
(=) cumulative ever	—	—	4	16	54	138	210	229

SOURCE: See text

TABLE 47: Predicted Sexual, First Marital, First Pregnancy Outcome Histories of 10,000 Adolescent Females in the United States, by Age in Exactly Completed Years

Black Females

FIRST MARRIAGE/FIRST PREGNANCY OUTCOME STATUS	AGE IN COMPLETED YEARS (EXACT)							
	13	14	15	16	17	18	19	20
SINGLE VIRGIN								
(-) to marriage not p.	10	97	186	339	506	503	360	216
(-) to single non-virgin	250	338	638	1205	1640	1520	966	552
(=) remaining	9740	9305	8481	6937	4791	2768	1442	674
SINGLE NON-VIRGIN								
(+) from single virgin	250	338	638	1205	1640	1520	966	552
(-) to marriage, not p.	—	6	23	89	245	422	488	442
(-) to single pregnant	19	43	124	411	610	813	868	449
(=) remaining	231	520	1011	1716	2501	2786	2396	2057
cumulative ever s non-v	250	588	1226	2431	4071	5591	6557	7109
FIRST MARRIAGE, NOT PREG.								
(+) from single virgin	10	97	186	339	506	503	360	216
(+) from single non-v	0	6	23	89	245	422	488	442
(=) cumulative total	10	113	322	750	1501	2426	3274	3932
SINGLE PREGNANT								
(+) from single non-v	19	43	124	411	610	813	868	449
(=) ever single pregnant	19	62	186	597	1207	2020	2888	3337
S. PREGNANT, MARRIAGE, OUT.								
(+) from single pregnant	1	3	9	39	63	32	81	4
(=) cumulative ever	1	4	13	52	115	147	228	232
S. PREGNANT, ABORTION								
(+) from single pregnant	2	4	11	33	0	65	66	145
(=) cumulative ever	2	6	17	50	50	115	181	326
S. PREGNANT, MISCARRIAGE								
(+) from single pregnant	3	7	21	69	24	0	78	39
(=) cumulative ever	3	10	31	100	124	124	202	241
S. PREGNANT, O-W BIRTH								
(+) from single pregnant	3	29	83	270	523	716	643	261
(=) cumulative ever	13	42	125	395	918	1634	2277	2538

SOURCE:

transitions. For example, a female is only eligible for abortion if she conceives; reducing the number of conceptions is likely to have an impact on the number of abortions.

The projections presented in Tables 46 and 47 represent straightforward extrapolations of current trends. What if some of the current trends change? We discussed earlier evidence of a tendency for more recent birth cohorts to commence sexual activity at younger ages. Extrapolating the empirically derived probabilities of first intercourse, we can estimate the impact of a continuation of this trend. Table 48 presents the projected probability of sexual intercourse, by race, for cohorts of females born in 1950, 1953, 1956, 1959 and 1962. Clearly, among both race groups and at every age, the probability of beginning sexual activity rises steadily as the year of birth becomes more recent. The magnitude and rapidity of these changes is truly striking. They imply a dramatic increase in the size of the populations at risk of pregnancy, venereal disease, abortion, out-of-wedlock childbearing and forced marriage. The change is most noticeable among whites because of their lower base level; however, because of their early entry into sexual activity, blacks are exposed longer. (The reader is reminded that the data represent <u>projections</u> for only the last two birth cohorts; in addition, we are only talking about a total time period of twelve years.) To estimate the magnitude of these changes, additional projections were run.

Table 49 reports the number of females from each birth cohort who would remain virgin at the ages of 16 and 20 under these projections. In addition, the number who would experience a premarital pregnancy and the number who would have an o-w birth by ages 16 and 20 is reported. According to these results, a cohort of 10,000 white females born in 1959 will have 264 premarital pregnancies and 38 out-of-wedlock births by their 16th birthday. A cohort of 10,000 black females

TABLE 48: Projected Sexual Activity Probability for Females 13-20, Developed by Linear Projections of Cohort Coefficients[1]

Birth Cohort	Age 13	14	15	16	17	18	19	20
				White Females[1]				
1950	0	0	7	27	0	16	78	136
1953	8	11	21	41	84	130	192	250
1956	22	25	35	55	198	224	306	364
1959	37	40	50	70	312	356	420	478
1962	51	54	64	84	426	470	534	592

1. Projection Equations:

Ages 13-16: Cohort coefficient = .0056 + .0048 (Cohort - 1950)

Ages 17-20: Cohort coefficient = .043 + .038 (Cohort - 1950)

				Black Females[2]				
1950	0	0	18	96	220	319	366	415
1953	25	35	70	148	255	354	401	450
1956	77	87	122	200	290	389	436	485
1959	129	139	174	252	325	424	471	520
1962	181	191	226	304	360	459	506	555

2. Projection equations:

13-16: Cohort coefficient = .0133 + .0173 (Cohort - 1950)

17-20: Cohort coefficient = .298 + .0115 (Cohort - 1950)

TABLE 49: Sensitivity Experiments: Extrapolating Cohort Trends in Sexual Activity For 1950-1962 Birth Cohorts of 10,000 Females

Cohort	By 16th Birthday			By 20th Birthday		
	Females who Have Remained Virgin	Females who Have Experienced a Premarital Pregnancy	Females who Have Experienced a First Out-of-Wedlock Birth	Females who Have Ramained Virgin	Females who Have Experienced a Premarital Pregnancy	Females who Have Experienced a First out-of-Wedlock Birth
White Females						
1950	9185	39	6	3983	321	53
1953	8763	109	16	2341	1062	229
1956	8267	184	27	1224	1527	317
1959	7765	264	38	576	1955	418
1962	7317	336	49	234	2270	496
Black Females						
1950	8260	201	138	998	2677	2046
1953	6937	597	395	674	3337	2538
1956	5508	1064	705	426	3999	3023
1959	4311	1473	976	261	4531	3408
1962	3321	1828	1212	155	4956	3711

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will have 1,473 premarital pregnancies and 976 out-of-wedlock births. (A higher proportion of black pregnancies terminate in out-of-wedlock births because whites have tended to resort to marriage and abortion more frequently than blacks.) By age 20, the white cohort will have 1,955 premarital pregnancies and 418 out-of-wedlock births, while the blacks have 4,531 pregnancies and 3,408 births outside of marriage.

The trends in increased sexual activity and pregnancy by birth cohort are extremely pronounced. Whereas nearly 40 percent of the 1950 white cohort remained virgin at age 20, only 2 percent of the 1962 cohort is expected to do so. Among blacks, the decline is from 10 percent to about 2 percent. Further, where the white cohort born in 1950 would produce 53 out-of-wedlock births, the 1962 cohort would produce 496 by age 20. Black cohorts would have 2,046 and 3,711 births, respectively. These trends are portrayed graphically in Figures 11 and 12.

Because these increases are so remarkable and because they are based on a 1971 survey, it seems important to compare them with National Center for Health Statistics records, as far as it is possible to do so. The most up-to-date comparison that is possible is the cumulative number of out-of-wedlock births by age 20 to females born in 1956, that is, up through 1975. These women are expected to produce 317 out-of-wedlock births per 10,000 white females; stated differently, 3.17 percent of the white females are expected to have a first out-of-wedlock birth by age 20. Actually, 3.29 percent did have first out-of-wedlock births. Similarly, we predict 30.23 percent of the black females will have first out-of-wedlock births; 25.64 percent actually did.* Thus, our projections may be just slightly on the

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*Calculations based on data from the "Advance Report, Final Natality Statistics," for the years 1970-1974; "Estimates of the Population of the United States by Age, Sex and Race: 1970-1975," Table 2; and "Premarital Fertility," Current Population Reports, Special Studies, Series P-23, No. 63 (August 1976), Table 19.

FIGURE 11: White Females: Extrapolating Cohort Trends in Sexual Activity, and Premarital Pregnancy for Cohorts of 10,000

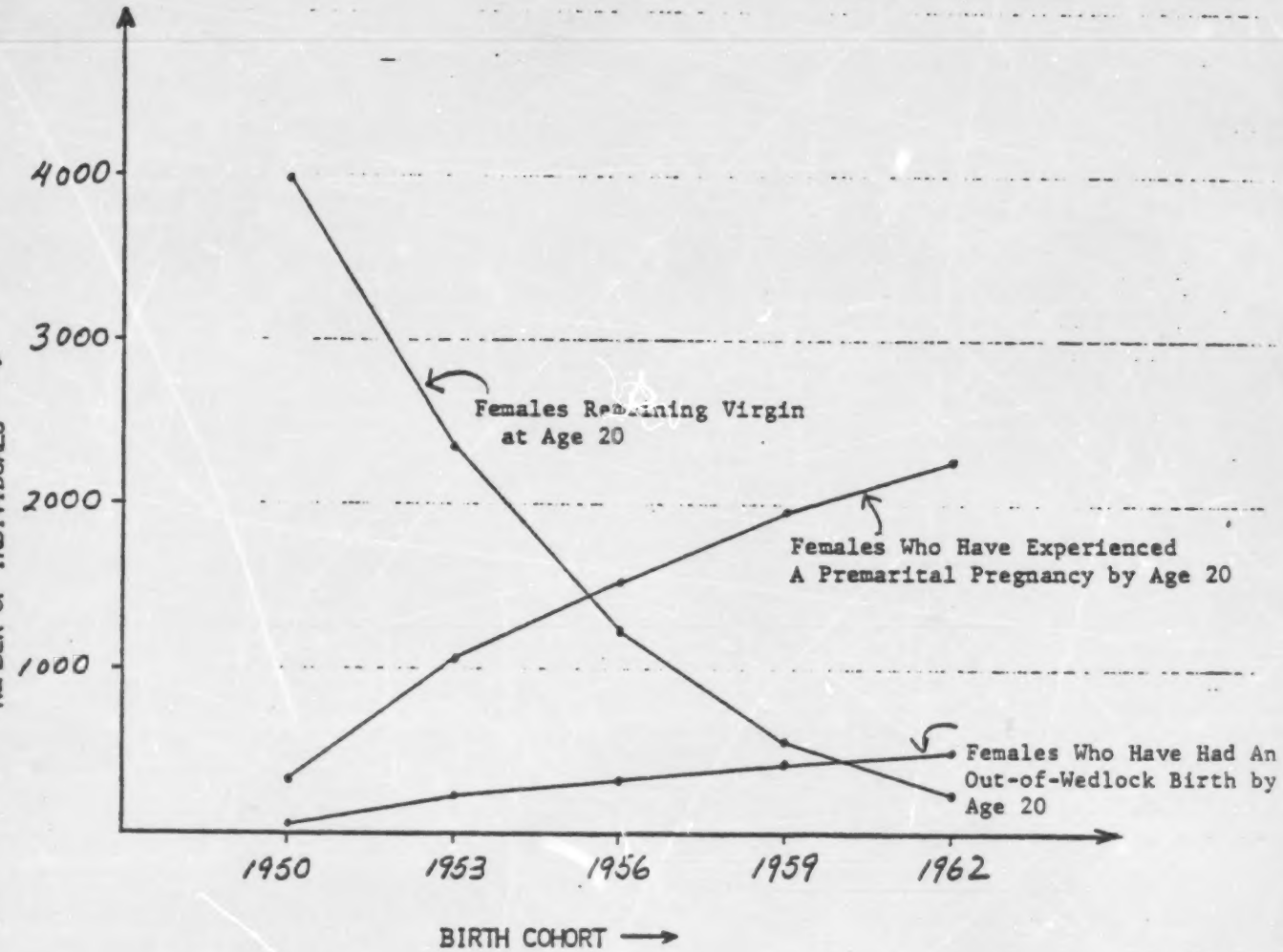
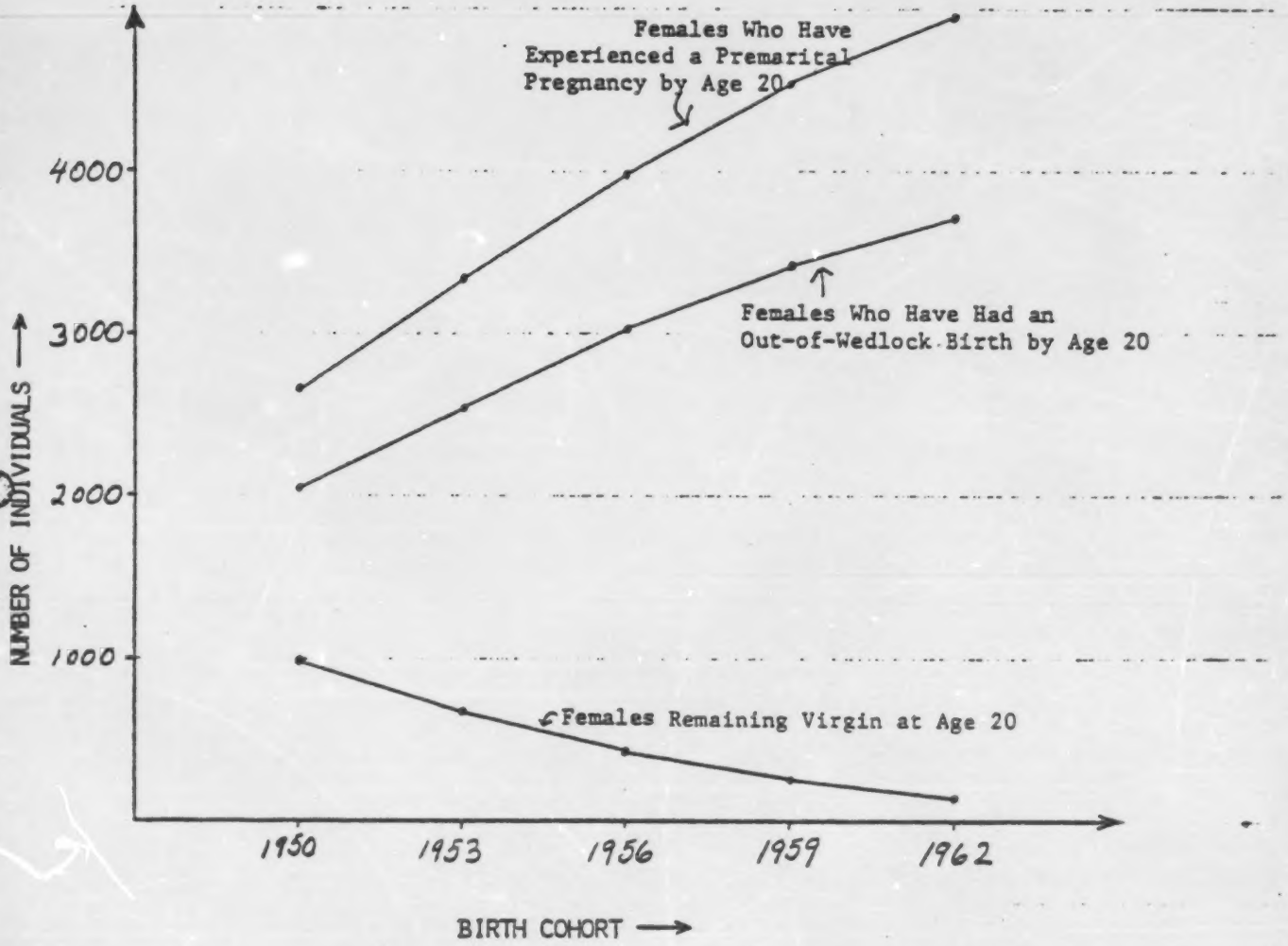


FIGURE 12: Black Females: Extrapolating Cohort Trends in Sexual Activity, and Premarital Pregnancy for Cohorts of 10,000



low side for whites and somewhat too high for blacks. This is in keeping with National Center for Health Statistics data indicating that early adolescent and out-of-wedlock fertility has fallen among blacks since 1971, but not for whites.

Reducing the number of pregnancies among those who do not wish to be pregnant is a goal to which we have frequently alluded. Using the sensitivity analysis approach, we can examine the impact of a lowered pregnancy rate on the proportion of women who end up in different outcome states by their 20th birthday. If, for example, the white pregnancy probabilities are applied to the black population, together with the black probabilities for sexual activity, marriage and abortion, we can examine the impact of this particular factor on the distribution of twenty-year-old black females. These data are reported in Table 50. Comparing Table 50 with Table 47, it is immediately clear that the cumulative number of out-of-wedlock births to this group would be considerably reduced, from 2,538 to 1,480, if the white pregnancy proportion did hold. The number of abortions and miscarriages would be reduced as well. Correspondingly, the number who would marry prior to becoming pregnant would be greater.

Comparable analyses can be conducted by simply varying the different probabilities. Several examples are included in Appendix Tables 8-11. The effects of the variations in these several Appendix tables are summarized in Table 51. The top half of the table reports the effect of substituting a black proportion for a white proportion.* For example, if the black probability of making the transition to sexual activity were applied to a population which had white probabilities for making the other transitions, the 10,000 females would have 425

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* We concentrate a good deal of attention on black-white differences in out-of-wedlock birth rates, not only because these differences are large and important, but because this is a useful way to illustrate the dynamics of the system as a whole.

TABLE 50: Predicted Sexual, First Marital, First Pregnancy Outcome Histories of 10,000 Adolescent Females in the United States, by Age in Exactly Completed Years Using White Pregnancy Probabilities and Black Sex, Marriage and Abortion Probabilities

FIRST MARRIAGE/FIRST PREGNANCY OUTCOME STATUS	AGE IN COMPLETED YEARS (EXACT)							
	13	14	15	16	17	18	19	20
SINGLE VIRGIN								
(-) to marriage not p.	10	97	186	339	506	503	360	216
(-) to single non-virgin	250	338	638	1205	1640	1520	966	552
(=) remaining	9740	9305	8481	6937	4791	2768	1442	674
SINGLE NON-VIRGIN								
(+) from single virgin	250	338	638	1205	1640	1520	966	552
(-) to marriage, not p.	—	6	24	93	264	480	624	612
(-) to single pregnant	—	0	81	249	302	258	651	506
(=) remaining	250	582	1115	1978	3052	3834	3525	2959
cumulative ever s non-v	250	588	1226	2431	4071	5591	6557	7109
FIRST MARRIAGE, NOT PREG.								
(+) from single virgin	10	97	186	339	506	503	360	216
(+) from single non-v	—	6	24	93	264	480	624	612
(` cumulative total	10	113	323	755	1525	2508	3492	4320
SINGLE PREGNANT								
(+) from single non-v	—	—	81	249	302	258	651	506
(=) ever single pregnant	—	—	81	330	632	840	1541	2047
S. PREGNANT, MARRIAGE, OUT.								
(+) from single pregnant	—	—	6	24	31	10	61	5
(=) cumulative ever	—	—	6	30	61	71	132	137
S. PREGNANT, ABORTION								
(+) from single pregnant	—	—	7	20	0	21	49	164
(=) cumulative ever	—	—	7	27	27	48	97	261
S. PREGNANT, MISCARRIAGE								
(+) from single pregnant	—	—	14	41	12	0	59	43
(=) cumulative ever	—	—	14	55	67	67	126	169
S. PREGNANT, O-W BIRTH								
(+) from single pregnant	—	—	54	164	259	227	482	294
(=) cumulative ever	—	—	54	218	477	704	1186	1480

SOURCE: Table 45 for sex, marriage and pregnancy outcome probabilities

TABLE 51: Sensitivity Experiments on Black/White Differences in Out-of-Wedlock First Births

	Number	Change From Standard	Percent Change
White Standard	229	—	—
With Black Sex	425	+ 196	+ 86%
With Black Pregnancy	366	+ 137	+ 60%
With Black Pregnancy Outcomes	776	+ 547	+239%
Black Standard	2538	—	—
With White Sex	1186	-1352	- 53%
With White Pregnancy	1480	-1058	- 42%
With White Pregnancy Outcomes	818	-1720	- 68%

SOURCE: Appendix Tables 8-11.

out-of-wedlock births by their 20th birthday, an increase of 86 percent. Similarly, if blacks had the same probability of pregnancy as whites, they would have (as we have seen above) 42 percent fewer out-of-wedlock births. Clearly, the most important race difference is not that of sexual activity or of pregnancy, although they are important, but the difference in what happens to a young woman who is pregnant, depending on whether she is black or white.

These kinds of sensitivity analyses can be done to evaluate the effects of numerous other variables. For example, the impact of ready availability of abortion or family planning could be explored. Or the females raised in single-parent households could be contrasted with other females. We will report here a set of projections done to evaluate the effect of reliable, effective family planning among teenagers, because the prevention of undesired conception appears to be one point in the process of o-w childbearing at which government policy can pragmatically and legitimately play a role. What if family planning services were so widely available and effective that no unwanted pregnancies occurred?

As we have noted previously, both the white and the black pregnancy probabilities incorporate a high proportion of unplanned, unintended pregnancies -- fully 70 percent. To explore the impact of perfect, consistent contraception among adolescents on their incidence of out-of-wedlock childbearing, we have performed a projection in which only "desired" pregnancies take place. To do this, we have multiplied the annual probability of pregnancy for blacks and whites, by age, by 0.3. This is certainly a crude approximation of the proportion of teenagers who desire pregnancy, since it is based on the statements of women who in fact became pregnant, <u>after</u> the occurrence of their pregnancy; the true proportion desiring pregnancy while teenagers is probably somewhat lower. In addition to decreasing the probability of becoming pregnant, it is necessary to

increase the probability of a legitimating marriage while decreasing the probability of abortion, and o-w birth, since desired premarital pregnancies more often terminate as legitimate live births, compared with undesired pregnancies, which more often terminate in abortion or in an o-w birth /as shown in Figure 10/.

The impact of "perfect contraception" for adolescents can be evaluated by comparing Tables 52 and 53 with Tables 46 and 47. The number of expected o-w pregnancies by age 20 is much reduced -- from 229 to 52 among whites and from 2,538 to 795 among blacks. There is an enormous decrease in the number of abortions -- from 278 to 25 among whites and from 326 to 36 among blacks -- that are necessary and a substantial decrease in the number of legitimating marriages also.

Though many of these results are of potential social significance, these analyses focus only on the never-married adolescent female population, and there are critical research gaps that need to be filled. We have virtually no awareness of the process, motivations, and concerns of males involved in premarital sexual activity and o-w pregnancy. We know little about the attitudes, needs, and behavior of formerly-married unwed females. We have not had access to adequate variables representing contraceptive use, and there is enormous need for study of contraceptive selection and use among the unmarried. In addition, we lack understanding of the interaction between the family and the unmarried person as it relates to the commencement of sexual activity, the use of contraception, and the handling of an o-w pregnancy. As noted, most of the variance in o-w sexual, conception, and childbearing behavior remains to be explained. Of course, findings that do not explain variance can still be of importance, for example, the lack of association in these analyses between welfare policies and o-w childbearing. And there are a number of policy-relevant conclusions that can be based on the current research. The concluding chapter briefly summarizes earlier chapters and suggests some directions for policy and for further research.

TABLE 52: Predicted Sexual, First Marital, First Pregnancy Outcome Histories of 10,000 Adolescent Females in the United States, by Age in Exactly Completed Years

White Females

FIRST MARRIAGE/FIRST PREGNANCY OUTCOME STATUS	AGE IN COMPLETED YEARS (EXACT)							
	13	14	15	16	17	18	19	20
SINGLE VIRGIN								
(-) to marriage not p.	10	50	117	302	560	826	988	780
(-) to single non-virgin	80	108	202	374	688	869	926	780
(=) remaining	9910	9752	9433	8756	7508	5813	3899	2339
SINGLE NON-VIRGIN								
(+) from single virgin	80	108	202	374	688	869	926	780
(-) to marriage, not p.	0	1	5	24	89	235	474	597
(-) to single pregnant	0	0	8	25	35	36	109	105
(=) remaining	80	187	377	703	1267	1865	2208	2285
cumulative ever s non-v	80	188	391	765	1454	2322	2349	4028
FIRST MARRIAGE, NOT PREG.								
(+) from single virgin	10	50	117	302	560	826	988	780
(+) from single non-v	0	1	5	24	89	235	474	597
(=) cumulative total	10	61	182	508	1158	2218	3681	5058
SINGLE PREGNANT								
(+) from single non-v	0	0	8	25	35	36	109	105
(=) ever single pregnant	0	0	8	33	68	104	213	318
S. PREGNANT, MARRIAGE, OUT.								
(+) from single pregnant	0	0	7	20	25	23	83	81
(=) cumulative ever	0	0	7	27	52	75	158	239
S. PREGNANT, ABORTION								
(+) from single pregnant	0	0	0	1	1	2	5	16
(=) cumulative ever	0	0	0	1	2	4	9	25
S. PREGNANT, MISCARRIAGE								
(+) from single pregnant	0	0	0	1	0	1	1	1
(=) cumulative ever	0	0	0	1	1	2	3	4
S. PREGNANT, O-W BIRTH								
(+) from single pregnant	0	0	1	3	9	10	20	7
(=) cumulative ever	0	0	1	4	14	25	46	52

TABLE 53: Predicted Sexual, First Marital, First Pregnancy Outcome Histories of 10,000 Adolescent Females in the United States, by Age in Exactly Completed Years

Black Females

FIRST MARRIAGE/FIRST PREGNANCY OUTCOME STATUS	AGE IN COMPLETED YEARS (EXACT)							
	13	14	15	16	17	18	19	20
SINGLE VIRGIN								
(-) to marriage not p.	10	97	186	339	506	503	360	217
(-) to single non-virgin	250	337	638	1205	1640	1518	966	552
(=) remaining	9740	9305	8481	6937	4791	2770	1443	675
SINGLE NON-VIRGIN								
(+) from single virgin	250	337	638	1205	1640	1518	966	552
(-) to marriage, not p.	0	6	24	94	274	504	646	679
(-) to single pregnant	6	13	39	130	206	292	346	208
(=) remaining	244	562	1138	2119	3278	4001	3976	3641
cumulative ever s non-v	250	587	1226	2431	4070	5588	6554	7106
FIRST MARRIAGE, NOT PREG.								
(+) from single virgin	10	97	186	339	506	503	360	217
(+) from single non-v	0	6	24	94	274	504	646	679
(=) cumulative total	10	113	324	757	1537	2544	3550	4445
SINGLE PREGNANT								
(+) from single non-v	6	13	39	130	206	292	346	208
(=) ever single pregnant	6	19	58	188	394	686	1031	1239
S. PREGNANT, MARRIAGE, OUT.								
(+) from single pregnant	1	1	4	20	34	19	52	3
(=) cumulative ever	1	2	6	26	60	79	131	134
S. PREGNANT, ABORTION								
(+) from single pregnant	0	0	1	3	0	6	7	18
(=) cumulative ever	0	0	1	4	4	11	18	36
S. PREGNANT, MISCARRIAGE								
(+) from single pregnant	2	4	12	35	22	48	69	84
(=) cumulative ever	2	6	17	52	74	122	191	275
S. PREGNANT, O-W BIRTH								
(+) from single pregnant	3	8	22	73	150	218	218	103
(=) cumulative ever	3	11	33	106	256	474	692	795

CHAPTER V: SUMMARY AND CONCLUSIONS

Having completed an extensive literature review and reported on new analyses of two data sets, several patterns have begun to emerge. To summarize this extensive body of information, the most significant conclusions from each chapter will be presented. From there, we can move on to a discussion of their meaning and relevance for public policy.

A. The Incidence of Out-of-Wedlock Childbearing

Although o-w birth rates have been falling among older women, they have not fallen much at all among teenagers. In addition, because of large declines in marital fertility, the proportion of all births that occur outside of marriage has been rising. Finally, because of the large number of young single women at risk of an o-w birth, over half of all o-w births occur to females aged 19 or younger. (See pages 4-13.)

B. Consequences for Parent, Child and Society of Out-of-Wedlock Childbearing

The overall consequences associated with bearing children out of wedlock for parent, society, and the child appear to be negative. Although it is not clear to what extent the disabilities are associated with the age or socio-economic background of the parent, with the legitimacy status of the birth, with the tendency for o-w births to be unplanned and often unwanted, with

difficulties attendant upon being a single-parent family, or with a lack of social and economic supports for such parents and children, families formed by an out-of-wedlock birth seem to be disadvantaged in a number of ways. They are characterized by lower incomes (pages 18-21), greater marital instability (pages 22-23), lower educational attainment for the parents (pages 15-18), and a larger eventual family size (pages 26-27). Children born out of wedlock have higher rates of mortality and morbidity (pages 14-15) than other children, and have what seems to be an extremely high probability of ending up on welfare (pages 78-79).

C. The Determinants of Out-of-Wedlock Fertility: An Accounting Model and Review of the Literature

Becoming a parent outside of marriage is viewed as a complicated process with multiple decision points. The first decision involves becoming sexually active prior to marriage. Important social changes seem to be occurring in matters of sex which have resulted in earlier initiation of sexual intercourse among more recent birth cohorts (pages 40-45). Together with the earlier arrival of biological maturity among the current generation (pages 36-37, 41-42) and a rising age at marriage (pages 32-33), the proportion of the population at risk of an out-of-wedlock birth seems to be increasing.

The use of contraception can, of course, prevent or postpone conception, and this represents the second stage of decision-making (pages 45-58). Because of widespread ignorance about the likelihood of conception, and about the availability and use of different contraceptives, conception is common among the sexually active. It is estimated that among sexually active teenagers, a fifth of whites and a third of blacks become pregnant each year (pages 82-83). Although the majority of unmarried adolescents do not wish to become pregnant, contraceptive use is highly erratic. Personality theories to explain this have

been less fruitful than theories that regard contraceptive decisions from the personal cost/benefit position of the decision-maker or theories that recognize the difficulties inherent in obtaining effective contraception for the unmarried person as well as the vast ignorance regarding conception and contraception among the unmarried population.

Among those who become pregnant, a third round of decision-making takes place. The decision to abort is made by nearly a third of both blacks and whites, and the availability of abortion represents a crucial factor in preventing o-w births among those who do not wish to have the child (pages 65-68). Marriage in order to legitimate an out-of-wedlock conception is a more common resolution among whites than among blacks (pages 67-69). The incidence of miscarriage appears not to differ by race (pages 58 and 81). However, because they are more likely to be sexually experienced at a given age, more likely to conceive once sexually active, and less likely to marry before the birth, blacks give birth to a much higher proportion of births out of wedlock than do whites. Indeed, the absolute number of o-w births is greater for blacks.

On the basis of this literature review, an accounting model was developed to trace the eligible population through the steps in the process of becoming an o-w parent (pages 79-84). Although many of the estimates derived from the literature are imprecise, when combined they produce what seems to be a reasonably accurate first approximation of the process, and highlight those points in the process at which policy can have an impact. For example, as noted above, the proportion who conceive among those who are sexually experienced is estimated to be 21 percent among whites and 34 percent among blacks. Clearly, better contraceptive services and sex education could help reduce these proportions. In addition, only a third of those premaritally pregnant obtain abortions, a proportion which might be considerably higher if abortion services were more accessible.

Viewing out-of-wedlock childbearing from the perspective of the accounting model also highlights the steps at which intervention is not pragmatic or appropriate, for example, reducing the percent fecund, increasing the percent who miscarry, or somehow changing the proportion who become sexually active. It also suggests points at which government policy might be having unintended side effects, for example, discouraging marriage among young parents who would have to give up AFDC payments, or discouraging the use of birth control by requiring parental consent.

In addition, the process can be extrapolated to look at additional outcomes, for example, later reliance on welfare support. Comparison of the number of children born out of wedlock over the years with the number of out-of-wedlock children receiving AFDC benefits (having subtracted out those out-of-wedlock children who were adopted or who died) suggests that approximately 60 percent are on welfare at any particular point in time (pages 78-79).

Finally, the crudeness of the numbers that constitute the best estimates available for use in the accounting model suggests the need for better data on the topic. It may be difficult to obtain accurate information on abortion and to develop a measure of the probability of conception, but it seems feasible to develop more detailed data on the characteristics of children on welfare and of children who are adopted, if only by race, from all states.

D. The Determinants of Out-of-Wedlock Fertility: Data Analysis

In Chapter IV, the analysis of two complementary data sets is reported. The first is an individual or "micro" data set generated by interviews with females aged 15 to 19 in 1971. The second, "macro" data set represents a compilation of state-level variables for 1974. The relative detail of the micro data set permits analysis of the process of becoming an out-of-wedlock

parent in three stages: the annual probability of making the transition to sexual activity; the annual probability of making the transition to pregnancy among the sexually active; and the probability of abortion, marriage, or an out-of-wedlock birth as the outcome of pregnancy. Although the three stages cannot be separated in the macro analysis, the macro data set has the strength of being more up-to-date. Factors associated with the three transitions in the micro analysis are summarized first.

— The Probability of Premarital Sexual Activity: Public policy variables, including AFDC benefits, AFDC acceptance rates, family planning services, and abortion availability, were not concluded to increase the likelihood that an unmarried virgin will have sexual intercourse. Teenagers were found to have a higher probability of making the transition as they become older, if their father (or male raiser) is relatively poorly-educated, if (among non-blacks) they live on the Pacific coast, if they are black, and if they are from a more recent birth cohort or a non-intact family. (See pages 99-110; Table 37; Figures 6 & 7).

— The Probability of Pregnancy Among Sexually Experienced, Unmarried Teenagers: In the second stage, the probability of pregnancy among the group who are sexually experienced was examined. A more detailed annual probability of pregnancy than developed previously was calculated to be 9 percent for whites aged 12 to 16, 12 percent for whites 17-19, 17 percent for blacks 12 to 16 and 24 percent for blacks 17-19. High state AFDC benefit levels and acceptance rates were not found to be associated with a greater probability of pregnancy. Nor was abortion availability found to encourage pregnancy. On the other hand, a high unmet need for subsidized family planning services was found related to a higher incidence among older black teenagers. Overall, the likelihood of conception was found to be highest among blacks, among females with relatively poorly-educated mothers, among those aged fifteen or older (who are more fecund),

TABLE 54: Summary of Results from New Analyses as Reported in Chapter Four

Variable	Direction of Association			
Micro Analysis: Probability of Transition to Sexual Activity	Whites 12-15	Whites 16-18	Blacks 12-15	Blacks 16-18
Older Age	+	+	+	+
Higher education of father or male raiser	-	-	-	-
Higher education of mother or female raiser	0	0	0	0
Recency of birth cohort	+	+	+	0
More frequent church attendance	-	-	-	-
Respondent Catholic	0	0	0	0
Non-intact structure of family of origin	+	+	+	+
Region: Respondent lives on Pacific coast	+	+	0	-
Farm background	-	0	0	0
Rural residence	-	-	-	-
Central city residence	+	+	+	+
High AFDC benefits	0	+	0	0
High AFDC acceptance rate	0	-	-	0
High unmet need for family planning	(	0	0	0
High abortion availability	0	0	0	0
Micro Analysis: Probability of Transition to Pregnancy				
Older age	+	+	+	0
Higher education of father or male raiser	0	0	0	0
Higher education of mother or female raiser	-	-	-	0
Recency of birth cohort	0	0	-	0
Respondent Catholic	0	0	+	+
Raised by father and mother or by mother	0	0	0	-
High importance of religion to respondent	0	+	0	0
1 to 2 years intercourse experience	+	+	+	0
High unmet family planning needs	0	0	0	+
Urban/rural residence	0	0	0	0
High abortion availability in state of residence	0	0	0	0
High AFDC benefits	0	0	-	0
High AFDC acceptance rate	0	0	0	0
Ever used contraception	0	0	0	0

Pregnancy Outcome (all ever-pregnant respondents included in same regression)	Abortion	Marriage	O-W Birth
Older age	0	0	0
Pregnancy desired	-	+	-
Recency of pregnancy (calendar year)	+	0	0
High abortion availability	+	0	-
High importance of religion to respondent	-	0	0
Respondent Catholic	0	0	0
Respondent white	+	+	-
Non-intact family of origin	0	0	0
Urban/rural residence	0	0	0
High AFDC benefits	-	0	0
High AFDC acceptance rates	0	0	-
AFDC coverage of unemployed fathers exists	0	0	-
College-educated father or male raiser	+	0	-

State Level Analysis	White			Black		
	15-19	20-24	15-44	15-19	20-24	15-44
AFDC benefit level	0	0	0	0	0	0
AFDC acceptance rate	0	0	0	0	0	0
Abortion availability	-	-	-	0	0	0
Family planning availability	0	0	0	-	0	0
Age of consent for contraception = 18+	0	~	~	+	~	~
Age of consent for abortion = 18+	0	~	~	0	~	~
AFDC unemployed father program	0	0	0	0	0	0
AFDC unborn child coverage	0	0	0	0	0	0
Medicaid abortion coverage	0	0	0	0	0	0
Median educational attainment	0	0	0	0	0	0
Percent of work force unemployed	0	0	0	-	0	0
Percent females 15-34 employed	0	0	0	0	0	0
Female earnings	0	0	0	+	0	0
Female/male earnings ratio	0	0	0	0	0	0
Percent of state in SMSAs	0	0	0	0	0	0
Percent of state Catholic	0	0	0	0	0	+

Key:

+ = positive association
- = negative association
0 = no association that is statistically significant
~ = age of consent not relevant to this age group

and among females who did not live in intact families when they were aged 10 to 15. Teenagers who regard their religion as important to them, and black Catholics are slightly more likely to become pregnant. Longer exposure to sexual intercourse is also associated with a higher annual probability of conception. Little impact of individual contraceptive use was documented, probably because of the lack of detail in the variable available for analysis, but probably also because of the sporadic and ineffective use of contraceptives among adolescents. (See pages 110-120; Table 39; Figures 8 and 9).

— Pregnancy Outcome: In the third stage, the outcome of a premarital pregnancy is explored. Having excluded those with miscarriages from the sample, possible outcomes include abortion, marriage before birth, and out-of-wedlock birth. Hypothesizing that a premarital pregnancy forces more conscious, considered decision-making than that which might characterize the earlier transitions, the effect of policy variables was expected to be most evident at this stage of the analysis. However, neither the level of AFDC benefits nor AFDC acceptance rates were found to be associated with a tendency to bear the child out of wedlock. AFDC coverage for unemployed fathers was found to be associated with a lower probability of delivering a child outside of marriage, not, apparently, because the program increases the likelihood of marriage, but because, for an unknown reason, the existence of such a program is associated with a greater frequency of abortion. Young women living in states with relatively liberal abortion policies were significantly more likely to have abortions and, correspondingly, were less likely to bear a child out of wedlock or to marry to legitimate the pregnancy. The probability of obtaining an abortion was much higher for daughters of college-educated men, for whites and for girls pregnant after the year 1969. Blacks were considerably less likely to obtain an abortion or to marry, and, consequently, were significantly more likely to bear their child out of wedlock. Those teen-

agers who desired their pregnancy, though a minority, were considerably less likely to have abortions and very likely to marry before delivery; because of their high rate of marriage, they were also less likely to experience an out-of-wedlock birth.

Four critical patterns were identified, then, at this stage of the analysis. Young women living in states with high to moderate abortion availability and those having college-educated fathers or male raisers were significantly more likely to obtain abortions. Those young women who desired their pregnancies were especially likely to marry. And black teenagers were far less likely to marry or obtain abortions and thus much more likely to carry their pregnancy to term outside of marriage. (See pages 120-129; Table 41; Figure 10.)

— State Out-of-Wedlock Birth Rates in 1974: Analysis of the macro, state-level data set strengthens the impression that public welfare policies do not act as economic incentives to childbearing outside of marriage. Neither the AFDC benefit level nor the AFDC acceptance rates were associated with the out-of-wedlock birth rates of blacks or whites.

Abortion availability is negatively associated with white out-of-wedlock birth rates, but there is no association with black rates. Since we know that nonwhites obtain nearly 30 percent of the abortions performed in the United States, it seems surprising that abortion availability is not related to black out-of-wedlock birth rates. This is probably due to the lack of detailed state-level data on abortion availability. We do find that existence of a state law limiting family planning services to women aged 18 or older is associated with significantly higher out-of-wedlock fertility among black teenagers. In addition, there is a negative association between the availability of subsidized family planning services and black out-of-wedlock fertility, but no association with white rates. It seems probable that the availability of subsidized family

planning services is most important to blacks, because of their frequently disadvantaged income position.

Overall, measures of attitudes, social controls, alternatives to childbearing and the motivation for pregnancy and childbearing were not related to the out-of-wedlock birth rate on a state level. These kinds of variables are probably best studied with micro survey data. In general, the analysis conducted on the micro data set is more satisfying. Decisions regarding sexuality and reproduction are intensely personal, and are better addressed on an individual level. One value of the macro analysis, however, is to explore whether individual decisions add up to anything. That is, can an aggregate effect of contextual variables be identified? The variables of primary interest here are, of course, public policy variables, and it does not appear that AFDC benefits encourage out-of-wedlock childbearing. In addition, subsidized family planning relates to lower black out-of-wedlock fertility, while abortion availability is associated with lower white out-of-wedlock fertility. It is reassuring that on these crucial questions, the two complementary approaches are in accord. (See pages 130-137.)

— Sensitivity Analyses: In a final step, the transition probabilities produced in the micro regressions are applied to an initial population of virgin twelve-year-old females as they are "aged" forward to their twentieth birthday. The utility of this procedure is that it permits one to combine results from the several stages of the analysis (transition to sexual activity, pregnancy, and pregnancy outcome), and, at the same time, to vary one or more parameters, in order to evaluate the impact of that variable. Two policy-relevant findings are especially worth mentioning. First, it appears that important increases in the probability of early sexual intercourse are taking place. (See Figures 11 and 12, pages 149 and 150.) Thus, a far larger proportion of more recent birth cohorts seem to be exposed to the possibility of premarital pregnancy and

out-of-wedlock childbearing. Second, examining the impact of preventing all of those pregnancies not desired by teenage women indicates that preventing all unwanted conceptions would reduce the estimated percent of young women experiencing out-of-wedlock births by age 20 from 2 percent to 0.5 percent for whites and from 25 percent to under 8 percent for blacks. Clearly, the impact of providing birth control services to teenagers so that they could prevent unwanted pregnancies would have an important effect in reducing the number of out-of-wedlock births that occur. In addition, the number of abortions needed by unmarried women would be reduced perhaps by a factor of ten (comparing Tables 52 and 53 with Tables 46 and 47).

E. Discussion and Conclusions

Certainly the most important policy conclusion to be drawn from these analyses is that the level of AFDC benefits and the AFDC acceptance rate do not seem to serve as economic incentives to childbearing outside of marriage for either blacks or whites. In addition, the availability of contraception and abortion do not seem to encourage the individual to begin sexual activity. However, the availability of subsidized family planning services does seem to lower pregnancy rates, especially among black teenagers; and the availability of abortion does seem to substantially reduce the incidence of out-of-wedlock childbearing among those who are premaritally pregnant, especially for whites.

Knowledge and information about conception and contraception seem to be important as well. The educational attainment of the mother (or female raiser) is assumed to affect the amount of information a young female has, and it is found that females with relatively poorly-educated mothers are more likely to become pregnant. Further, states which prohibit family planning services to teenagers have significantly higher o-w birth rates among blacks aged 15 to 19 --

almost 20 more births per 1,000 unmarried females of that age group. However, use of contraception among the young, unmarried population frequently seems to be erratic and ineffective. Provision of better services and more information to those who want them seems to be an important policy goal.

It is also essential to recognize that although most unmarried people do not report that they desire pregnancy, some do. These people are unlikely to seek abortions and are especially likely to marry before the birth. Although information about the difficulties of early and single parenthood might be made more available to these people, in general it is the population who do not wish to become parents premaritally who will be most motivated to take advantage of birth control information and services.

Personal and family life style also seem to be important explanatory factors. An intact family and religious commitment seem to reduce the probability of sexual activity and pregnancy. Social and cultural factors are pertinent as well. For example, more recent birth cohorts, whites on the Pacific coast, and blacks are more likely to be sexually active, even after controlling for other factors. However, it is crucial to acknowledge that most of the variance remains unexplained. (Of course, instead of disaggregating the sample by age and race, these factors could have been added as independent variables, thereby producing much more respectable R^2s. But this would not have meant we were actually explaining more about the process.) Other variables, not available in these data sets, certainly merit exploration. No really good retrospective measures of family income and social status were available, and it would be desirable to include some measures of these important factors. In addition, a number of personal level attributes are probably very important influences. For example, we still don't know the dynamics of the conception process among those not intending or desiring conception. What is the role of peer group pressure?

How do sex-role attitudes affect the use of contraception and the desire for pregnancy? Also, we know little about the values, motivations, and expectations of unmarried males. Certainly the decision to be sexually active and to use contraception is an interactive process. How do unmarried males see their roles and responsibilities? One should note, too, that it is not likely that all or nearly all of the variance will ever be explained. For example, research suggests that first intercourse experiences are typically unprotected or only marginally protected and that both fecundity and luck can be critical factors.[98]

The possibility that fertility control among unmarried persons has an inherently different dynamic from the process among married persons must also be considered. One crucial difference is that unmarried people are, almost by definition, involved in less stable sexual relationships than are married people. In addition, premarital encounters often represent people's first sexual experiences and thus occur in a fairly inexperienced population, one which may be experiencing first love as well as first intercourse. Perhaps it is expecting too much to think that young, unmarried persons will be able to define themselves as sexually active and fecund, take preventive action, never forget to use contraception, and never get caught up in the heat of the moment. The difficulty of planning ahead for the unmarried person who is not involved in a stable, long-term relationship may mean that abortion as an after-the-fact method of pregnancy "prevention" will remain an important recourse, especially for the youngest age group.

Although the current analysis has moved forward our level of understanding somewhat, and has advanced the methodology used in the study of sexual activity and reproduction among the unmarried, in many ways the results are still descriptive. We know that the education of the father affects the likelihood that a young unmarried woman will become sexually experienced but that among

the sexually active it is the education of the mother that affects the probability of pregnancy. Later, it is having a college-educated father that affects the likelihood that a premaritally pregnant female will obtain an abortion. The decision-making processes that underlie these associations are undoubtedly extremely complex. As noted earlier, we can count the offspring of unmarried people and estimate other important statistics, such as the proportion sexually active and the proportion having abortions, but we have little idea what causes or explains the numbers. Even at this point, we do not have a handle on the decision-making process at the level of the individual person or couple.

The focus and the central task of this research effort has been to explore whether public welfare policies affect the occurrence of out-of-wedlock childbearing. The answer to this question provided by the current research is "no, welfare benefits do not appear to provide an economic incentive that encourages bearing children outside of marriage." To answer the question of what really does motivate or explain childbearing outside of marriage will require a great deal of further, very sophisticated and detailed analytic research.

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APPENDIX

APPENDIX TABLE 1.: State Level Policy Variables Added to Kantner/Zelnik Data Set

State	AFDC Coverage of Unemployed Parent, 1970	AFDC: Yearly Amount Paid in State to a Family with 4 Recipients, July, 1971 / 1969 Median Family Income in State	AFDC Applications Accepted in State / AFDC Applications in State	1971 Abortion Availability 1 = Liberal 2 = Intermediate 3 = Restrictive	% Need for Subsidized Family Planning Services Met in State, 1969 1 = 0-10% of need met 2 = 10-20% of need met 3 = More than 20% of need Met
Alabama	1	.13	.80	3	2
Alaska	1	.18	.98	1	3
Arizona	1	.23	.34	3	2
Arkansas	1	.19	.69	2	1
California	0	.25	.68	1	2
Colorado	0	.24	.53	2	3
Connecticut	0	.28	.49	2	2
Delaware	0	.22	.50	2	3
District of Columbia	0	.26	.74	2	3
Florida	1	.20	.58	3	3
Georgia	1	.20	,89	3	2
Hawaii	0	.27	.77	1	1
Idaho	1	.34	.64	3	1
Illinois	0	.29	.78	3	2
Indiana	1	.18	.79	3	1
Iowa	1	.32	.82	3	1
Kansas	0	.33	.52	2	2
Kentucky	0	.30	.36	3	1
Louisiana	1	.19	.55	3	1
Maine	0	.31	.86	3	1
Maryland	0	.17	.44	2	3
Massachusetts	0	.33	.81	3	1
Michigan	0	.29	.39	3	2
Minnesota	0	.35	.47	3	2
Mississippi	1	.14	.54	3	1
Missouri	0	.18	.69	3	2
Montana	1	.32	.43	3	1
Nebraska	0	.28	.52	3	1
Nevada	1	.16	.65	3	3
New Hampshire	1	.32	.79	3	1
New Jersey	1	.37	.88	2	2
New Mexico	1	.30	.54	2	2
New York	0	.35	.75	1	3

Continued .....

APPENDIX TABLE 1 cont.

State	AFDC Coverage of Unemployed Parent, 1970	AFDC: Yearly Amount Paid in State to a Family with 4 Recipients, July, 1971 / 1969 Median Family Income in State	AFDC Applications Accepted in State / AFDC Applications In State	1971 Abortion Law in State: 1 = Liberal 2 = Intermediate 3 = Restrictive	% Need for Subsidized Family Planning Services Met in State, 1969 1 = 0-10% of need met 2 = 10-20% of need met 3 = More than 20% of need Met
North Carolina	1	.23	.49	2	2
North Dakota	1	.40	.64	3	1
Ohio	0	.22	.72	3	2
Oklahoma	0	.29	.70	3	2
Oregon	0	.28	.79	1	1
Pennsylvania	0	.35	.52	3	2
Rhode Island	0	.37	.61	3	3
South Carolina	1	.39	.80	3	1
South Dakota	1	.39	.80	3	1
Tennessee	1	.21	.64	3	1
Texas	1	.18	.46	3	2
Utah	0	.25	.80	3	1
Vermont	0	.36	.80	3	1
Virginia	1	.32	.65	2	1
Washington	0	.35	.67	1	1
West Virginia	0	.22	.83	3	1
Wisconsin	0	.26	.44	3	1
Wyoming	1	.27	.84	3	1

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APPENDIX TABLE 2: Variables Used in Micro (Survey of Females Aged 15-19 in 1971) Data Analysis, Showing Proportion of Sample in Each Category, by Age and Race

Transition to Sexual Intercourse

Dependent Variable

SEX = 1 sexual intercourse begins during this age-year
= 0 woman remains virgin through end of this age-year (reject all those who gave no answer to question, "Ever had intercourse" (n=52) or to question "age first had intercourse" (n=35))

Independent Variables	Proportion of Sample in Category			
	Whites		Blacks	
	12-15	16-18	12-15	16-18
A-1. Age-year at risk (years in lives of virgins) - dummy variables				
Age-year 12	.268	----	.278	----
13	.266	----	.270	----
14	.263	----	.260	----
15	.204	----	.192	----
16	----	.545	----	.621
17	----	.323	----	.305
18	----	.130	----	.074
A-2. Birth Cohort: 1971 minus age at survey, as a proxy to determine cohort - dummy variables				
If AGE = 15 Birth Cohort = 1955	.164	----	.175	----
= 16 = 1954	.216	----	.211	----
= 17 = 1953	.210	.184	.215	.200
= 18 = 1952	.204	.340	.233	.415
= 19 = 1951	.207	.476	.176	.384
A-3. Type of place of residence, at survey - dummy variables				
Central city of an SMSA	.254	.244	.540	.514
Suburbs of an SMSA	.351	.353	.143	.165
Non-SMSA, non-farm	.316	.321	.274	.276
Farm	.088	.083	.043	.045

	Proportion of Sample in Category			
	Whites		Blacks	
	12-15	16-18	12-15	16-18
A-4. Region of residence at survey - dummy variables				
Northeast	.239	.245	.227	.249
Northcentral, mountain	.427	.419	.323	.300
South	.204	.214	.393	.394
Pacific	.130	.122	.057	.054
A-5. Has respondent ever lived on a farm? - dummy variables				
Always	.065	.061	.039	.041
Sometimes	.099	.099	.117	.111
Never	.836	.840	.844	.848
A-6. Educational attainment of female raiser (including natural, adoptive and foster mothers, grandmother or other relative) - dummy variables				
Fewer than 9 years	.150	.141	.235	.238
9-11 years	.198	.175	.365	.353
12 years	.422	.431	.245	.236
Some college	.119	.138	.059	.063
College graduate or more	.095	.108	.040	.040
No female raiser or respondent doesn't know educational attainment of female raiser	.016	.007	.056	.070
A-7. Educational attainment of male raiser (including natural, adoptive and foster fathers, grandfather or other relative or mother's common law husband - dummy variables				
Fewer than 9 years	.204	.211	.283	.290
9-11 years	.161	.145	.206	.186
12 years	.324	.319	.220	.231
Some college	.096	.102	.057	.076
College graduate or more	.164	.179	.043	.041
No male raiser or respondent doesn't know educational attainment of male raiser	.040	.044	.192	.176

Appendix Table 2 cont.

	Proportion of Sample in Category			
	Whites		Blacks	
	12-15	16-18	12-15	16-18
A-8. Family structure when respondent aged 10-15 (with whom she mostly lived at ages 10-15) - dummy variables				
Mother and father (and siblings, if any)	.843	.877	.528	.572
Mother (and siblings, if any)	.122	.097	.357	.319
Father (and siblings, if any)	.023	.019	.031	.035
Other	.012	.007	.084	.074
A-9. Church attendance - the number of times attended religious services in month before survey - dummy variables				
No services	.325	.343	.252	.286
1-2 times	.186	.210	.194	.187
3-4 times	.271	.262	.377	.367
5-6 times	.091	.084	.076	.067
7 or more times	.127	.101	.101	.092
A-10. Whether Catholic - dummy variables				
Catholic	.302	.295	.074	.061
Non-Catholic	.698	.705	.926	.939
A-11. AFDC benefits relative to median income in 1969 in respondent's state of residence - coded into dummy variables*				
Less than or equal to .23 (Low)	.322	.332	.467	.432
.24 - .30 (Medium)	.310	.275	.245	.252
More than .31 (High)	.368	.393	.288	.316

	Proportion of Sample in Category			
	Whites		Blacks	
	12-15	16-18	12-15	16-18
A-12. AFDC acceptance rate in 1971 in respondent's state of residence (applications accepted as a proportion of applications received) - coded into dummy variables*				
Less than or equal to .50 (Low)	.241	.203	.240	.235
.51-.74 (Medium)	.439	.448	.474	.485
More than .75 (High)	.320	.349	.286	.280
A-13. Abortion availability in respondent's state of residence - coded into dummy variables*				
Liberal	.227	.218	.112	.092
Intermediate	.107	.104	.203	.191
Conservative	.666	.678	.685	.717
A-14. Family planning needs: percent of need for subsidized family planning services met in state in 1969 - coded into dummy variables*				
High unmet need	.281	.307	.236	.219
Medium unmet need	.546	.496	.587	.596
Low unmet need	.173	.197	.177	.185

Transition to Pregnancy

Dependent Variable

Pregnancy = 1 a first pregnancy occurred during this age-year to an unmarried, sexually-experienced female
= 0 if no pregnancy occurred to an unmarried, sexually experienced female

Independent Variables	Proportion of Sample in Category			
	Whites		Blacks	
	12-16 (Reg. 1&2)	17-19 (Reg. 1&2)	12-16 (Reg. 1&2)	17-19 (Reg. 1&2)
B-1. Age-year at risk (years in lives of virgins) - dummy variables				
Age-year 12,13	.098	----	.124	----
14	.147	----	.172	----
15	.301	----	.317	----
16	.455	----	.387	----
17	----	.401	----	.525
18	----	.194	----	.351
19	----	.405	----	.126
B-2. Birth Cohort: 1971 minus age at survey, as a proxy to determine cohort - dummy variables				
If AGE = 15 Birth Cohort = 1955	.149	----	.197	----
= 16 = 1954	.236	----	.248	----
= 17 = 1953	.209	.131	.232	.173
= 18 = 1952	.246	.336	.177	.366
= 19 = 1951	.160	.533	.146	.461
B-3. Type of place of residence, at survey - dummy variables				
Central city of an SMSA	.330	.293	.593	.570
Suburbs of an SMSA	.298	.333	.095	.117
Non-SMSA, non-farm	.349	.317	.289	.283
Farm	.054	.057	.023	.030
B-4. Whether Catholic - dummy variables				
Catholic	.249	.286	.066	.053
Non-Catholic	.751	.714	.944	.947
B-5. Importance of religion to respondent - continuous variable				
1 = Very important 2 = Fairly important 3 = Fairly unimportant 4 = Not important at all		(continuous variable)		

	Proportion of Sample in Category			
	Whites		Blacks	
	12-16 (Reg. 1&2)	17-19 (Reg. 1&2)	12-16 (Reg. 1&2)	17-19 (Reg. 1&2)
B-6. Family structure when respondent aged 10-15 (with whom she mostly lived at ages 10-15) - dummy variables				
Mother and father (and siblings, if any)	.717	.807	.470	.538
Mother (and siblings, if any)	.197	.145	.377	.347
Other	.052	.040	.153	.033
B-7. Educational attainment of female raiser (including natural, adoptive and foster mothers, grandmother or other relative) - dummy variables				
Fewer than 12 years	.436	.330	.663	.649
High School	.388	.390	.209	.212
More than 12 years	.153	.273	.055	.096
No female raiser or respondent doesn't know educational attainment of female raiser	.024	.007	.073	.043
B-8. Educational attainment of male raiser (including natural, adoptive and foster fathers, grandfather or other relative or mother's common law husband - dummy variables				
Fewer than 12 years	.471	.384	.516	.523
High School	.264	.308	.191	.223
Some College	.190	.265	.055	.079
College	.021	.020	.090	.078
No male raiser or respondent doesn't know educational attainment of male raiser	.054	.024	.149	.097
B-9. Contraceptive History				
Duration (years since first intercourse) / Ever Used Contraception				
Less than 1 year — Yes	.483	.374	.458	.238
Less than 1 year — No	.094	.054	.081	.041
1 - 2 years — Yes	.196	.296	.233	.340
1 - 2 years — No	.039	.035	.049	.045
2 or more years — Yes	.149	.212	.135	.294
2 or more years — No	.039	.029	.044	.041

Appendix Table 2 cont.

	Proportion of Sample in Category			
	Whites		Blacks	
	12-16 (Reg. 1&2)	17-19 (Reg. 1&2)	12-16 (Reg. 1&2)	17-19 (Reg. 1&2)
B-10. AFDC benefits relative to median income in 1969 in respondent's state of residence - coded into dummy variables*				
Less than or equal to .23 (Low)	.327	.315	.490	.449
.24 - .30 (Medium)	.392	.293	.281	.247
More than .31 (High)	.281	.392	.229	.304
B-11. AFDC acceptance rate in 1971 in respondent's state of residence (applications for AFDC as a proportion of applications approved) - coded into dummy variables*				
Less than or equal to .50 (Low)	.288	.215	.309	.271
.51 - .74 (Medium)	.425	.486	.457	.492
More than .75 (High)	.287	.299	.234	.237
B-12. Abortion availability in respondent's state of residence - coded into dummy variables*				
Liberal	.277	.216	.066	.053
Intermediate	.138	.156	.360	.354
Conservative	.585	.628	.574	.593
B-13. Family planning needs: percent of need for subsidized family planning services met in state in 1969 - coded into dummy variables*				
High unmet need	.201	.288	.227	.251
Medium unmet need	.639	.509	.570	.549
Low unmet need	.160	.203	.230	.200

Pregnancy Outcome

Dependent Variables

Abortion	1 = Pregnancy is terminated by an abortion (miscarriages excluded from analysis)
	0 = Pregnancy not terminated by abortion
Marriage	1 = Pregnancy is legitimated by marriage before birth (miscarriages excluded from analysis)
	0 = No marriage before birth
Out-of-Wedlock Birth	1 = Pregnancy ends in live birth or still birth out-of-wedlock
	0 = Not an out-of-wedlock birth

Independent Variables		Proportions for Regressions 1 & 2, for All Dependent Variables
C-1. Age-year - dummy variable		
Age-year	12-14	.064
	15	.172
	16	.221
	17	.232
	18	.247
	19	.063
C-2. Race - dummy variable		
White		.616
Black		.384
C-3. Type of place of residence, at survey - dummy variables		
Central city of an SMSA		.419
Suburbs of an SMSA		.191
Non-SMSA, non-farm		.338
Farm		.052
C-4. Family structure when respondent aged 10-15 (with whom she mostly lived at ages 10-15) - dummy variables		
Mother and father (and siblings, if any)		.613
Mother (and siblings, if any)		.277
Other		.110

		Proportions for Regressions 1 & 2 for All Dependent Variables
C-5. Educational attainment of male raiser (including natural, adoptive and foster fathers, grandfather or other relative or mother's common law husband - dummy variables		
Other		.910
College		.090
C-6. Whether Catholic - dummy variables		
Catholic		.191
Non-Catholic		.809
C-7. Importance of religion to respondent - continuous variable		
1 = Very important 2 = Fairly important 3 = Fairly unimportant 4 = Not important at all		(continuous variable)
C-8. Desired Child - dummy variable		
Desired		.290
Not desired		.710
C-9. AFDC benefits relative to median income in 1969 in respondent's state of residence - coded into dummy variables*		
Less than or equal to .23	(Low)	.358
.24 - .30	(Medium)	.376
More than .31	(High)	.266
C-10. AFDC acceptance rate in 1971 in respondent's state of residence (Applications for AFDC as a proportion of applications approved) - coded into dummy variables*		
Less than or equal to .50	(Low)	.343
.51 - .74	(Medium)	.462
More than .75	(High)	.195

Proportions for Regressions 1 & 2
for All Dependent Variables

C-11. Abortion availability in respondent's state of residence - coded into dummy variables*

Liberal	.197
Intermediate	.239
Conservative	.564

C-12. AFDC Unemployed Father Coverage - dummy variable

Program Exists in respondent's state of residence	.352
Program does not exist in respondent's state of residence	.648

C-13. Period (year pregnancy outcome occurred) - dummy variable		Regression 1	Regression 2
1970 - 71	(1970-71)	.651	.651
Before 1970	(1969)	.189	.349
	(1968)	.091	
	(Before 1968)	.064	

APPENDIX TABLE 3: Definitions and Sources of Independent Variables Used in Macro (State) Data Analysis

AFDC Benefits	Average monthly payment per recipient, July 1974, (HEW: NCSS Report A-2, July 1974, p. 6)
AFDC Acceptance Rate	Applications for AFDC assistance received during 1974 in each state divided by applications approved for money payments in 1974. (HEW: NCSS Reports, A-12 Series)
Family Planning Patients	The percent of all women in need of subsidized family planning services (200% of poverty + females 15-19) in 1975 who actually received services during fiscal year 1974 (Alan Guttmacher Institute, New York, New York)
Unemployed Father Program	Coverage of unemployed fathers under state AFDC program in 1974; dummy variable, with 1 = program present (HEW: NCSS Report, Series A-2, October 1974, p. 10)
Unborn Child Coverage	Coverage of unborn children under state AFDC program in 1974; dummy variable, with 1 = program present (Joint Economic Commission, Paper #20)
Medicaid Coverage of Abortion	Coverage of abortion in state under Medicaid Program throughout the year 1974; dummy variable, with 1 = coverage in 1974 (Alan Guttmacher Institute, Public Policy Unit)
Unemployment rate	Unemployment as a percent of the total work force, 1974 (1975 Statistical Abstract, p. 350)
Female Earnings	Median full-time earnings in 1969 of females, by race (U.S. 1970 Census)
Percent Females Employed	Percent of females aged 25-34 employed, by race (U.S. 1970 Census)
Earnings Ratio	Median full-time earnings of females as a percent of the full-time median earnings of males in each state, 1969, by race (U.S. 1970 Census)
Median Educational Attainment	Median educational attainment in 1970 in each state, of females aged 20-24 in years of schooling, by race (U.S. 1970 Census)

Age of Consent-Abortion	Age of consent for abortion in each state in June, 1974; dummy variable with 1 = 18+ (Family Planning Perspectives, Vol. 6, No. 3, Summer 1974, p. 143)
Age of Consent-Contraception	Age of consent for contraception in each state in June, 1974; dummy variable with 1 = 18+ (Family Planning Perspectives, Vol. 6, No. 3, Summer 1974, p. 143)
Percent of State in SMSAs	Percent of the state population living in SMSAs as defined by the Census Bureau, 1970 (1970 U.S. Census)
Percent of State Catholic	Percent of the state population that is Catholic, 1971 (Glenmary Research Center, Bethesda, Maryland)
Abortion Availability - Ordinal Measure	Created variable, based on abortion rate, abortion ratio, restrictive laws, and time since abortion legalized in state. Very available = California, D.C., Hawaii, Kansas, New York, Washington. Somewhat available = Alaska, Arizona, Colorado, Connecticut, Delaware, Florida, Georgia, Illinois, Iowa, Kentucky, Maine, Maryland, Massachusetts, Michigan, Minnesota, Nebraska, Nevada, New Jersey, New Mexico, North Carolina, Ohio, Oregon, Pennsylvania, Rhode Island, South Dakota, Tennessee, Texas, Vermont, Virginia, Wisconsin. Not very available = Alabama, Arkansas, Idaho, Indiana, Louisiana, Mississippi, Missouri, Montana, New Hampshire, North Dakota, Oklahoma, South Carolina, Utah, West Virginia, Wyoming.

APPENDIX TABLE 4 : States of the United States, by Whether Data on White and Black Out-of-Wedlock Births in 1974 is Available.

State	Whites	Blacks
Alabama	yes	yes
Alaska	yes	no
Arizona	yes	yes
Arkansas	yes	yes
California*	yes	yes
Colorado	yes	yes
Connecticut*	yes	yes
Delaware	yes	yes
District of Columbia	yes	yes
Florida	yes	yes
Georgia*	yes	yes
Hawaii	yes	no
Idaho*	yes	no
Illinois	yes	yes
Indiana	yes	yes
Iowa	yes	yes
Kansas	yes	yes
Kentucky	yes	yes
Louisiana	yes	yes
Maine	yes	no
Maryland	no	no
Massachusetts*	yes	yes
Michigan	yes	yes
Minnesota	yes	yes
Mississippi	yes	yes
Missouri	yes	yes
Montana	no	no
Nebraska	yes	yes
Nevada	no	no
New Hampshire	yes	no
New Jersey	yes	yes
New Mexico	no	no
New York*	yes	yes
North Carolina	yes	yes
North Dakota	yes	no
Ohio*	yes	yes
Oklahoma	yes	yes
Oregon	yes	yes
Pennsylvania	yes	yes
Rhode Island	yes	yes
South Carolina	yes	yes
South Dakota	yes	no
Tennessee	yes	yes
Texas	yes	yes
Utah	yes	no
Vermont*	yes	no
Virginia	yes	yes
Washington	yes	yes
West Virginia	yes	yes
Wisconsin	yes	yes
Wyoming	yes	no

*Denotes states that provided data especially for this study.

PENDIX TABLE 5 : Transition to Sexual Experience -- Regression Coefficients, by Age and Race (Analysis of Micro Data File: Females 15-19 in 1971)

	Whites				Blacks			
	Age-Years 12-15		16-18		Age-Years 12-15		16-18	
	Rgr. 1	Rgr. 2	Rgr. 1	Rgr. 2	Rgr. 1	Rgr. 2	Rgr. 1	Rgr. 2
Age-Year								
12	.000	.000	-	-	.000	.000	-	-
13	.003	.003	-	-	.010	.010	-	-
	(.003)	(.003)			(.009)	(.009)		
14	.013	.013	-	-	.045	.045	-	-
	(.003)	(.003)			(.009)	(.009)		
15	.035	.033	-	-	.124	.123	-	-
	(.004)	(.004)			(.010)	(.010)		
16	-	-	-.112	-.108	-	-	-.164	-.146
			(.020)	(.020)			(.062)	(.062)
17	-	-	-.065	-.062	-	-	-.071	-.056
			(.021)	(.021)			(.064)	(.063)
18	-	-	.000	.000	-	-	.000	.000
Cohort								
1955	.000	.000	-		.000	.000	-	-
1954	-.007	-.008	-		.019	-.019	-	-
	(.004)	(.004)			(.011)	(.011)		
1953	-.014	-.014	.000	.000	-.038	-.037	.000	.000
	(.004)	(.004)			(.011)	(.011)		
1952	-.010	-.010	-.053	-.052	-.065	-.064	-.074	-.069
	(.004)	(.004)	(.019)	(.018)	(.011)	(.011)	(.043)	(.043)
1951	-.022	-.023	-.069	-.066	-.068	-.064	-.028	-.023
	(.004)	(.004)	(.019)	(.019)	(.012)	(.012)	(.046)	(.045)
Church Attendance								
No services	.022	.023	.125	.121	.046	.050	.097	.110
	(.004)	(.004)	(.022)	(.022)	(.013)	(.013)	(.061)	(.058)
1-2 times(last month)	.020	.020	.115	.113	.014	.018	.066	.082
	(.005)	(.005)	(.023)	(.023)	(.013)	(.013)	(.063)	(.060)
3-4 times	.006	.005	.043	.046	.005	.007	.016	.032
	(.004)	(.004)	(.022)	(.022)	(.012)	(.012)	(.058)	(.056)
5-6 times	.007	.006	.022	.026	.010	.014	.038	.065
	(.006)	(.006)	(.028)	(.028)	(.016)	(.016)	(.079)	(.077)
7 or more times	.000	.000	.000	.000	.000	.000	.000	.000
Residence								
Central City	.004	.011	-.011	.045	.087	.061	.260	.176
	(.009)	(.005)	(.043)	(.024)	(.054)	(.018)	(.248)	(.076)
Suburbs of SMSA	.000	.006	-.050	.006	.068	.039	.216	.110
	(.009)	(.005)	(.042)	(.023)	(.055)	(.020)	(.253)	(.085)
Non-SMSA/non-farm	.009	.014	-.027	.024	.081	.062	.192	.106
	(.009)	(.005)	(.042)	(.024)	(.054)	(.018)	(.249)	(.077)
Farm	.000	.000	.000	.000	.000	.000	.000	.000

Appendix Table 5 cont.

Region								
Northeast	-.012	-.017	-.059	-.040	.014	-.014	.407	.192
	(.009)	(.004)	(.044)	(.021)	(.033)	(.016)	(.172)	(.073)
North Central, Mountain	-.009	-.010	-.051	.035	.024	.016	.359	.198
	(.009)	(.004)	(.041)	(.020)	(.025)	(.015)	(.128)	(.070)
South	-.016	-.019	-.057	-.020	.010	.005	.351	.229
	(.010)	(.005)	(.049)	(.022)	(.027)	(.016)	(.138)	(.070)
Pacific	.000	.000	.000	.000	.000	.000	.000	.000
Farm Background								
Always lived on farm	-.006		-.083		.028		.084	
	(.010)		(.047)		(.056)		(.261)	
Sometimes	-.009		-.031		.016		.000	
	(.004)		(.021)		(.011)		(.050)	
Never lived on farm	.000		.000		.000		.000	
Whether Catholic								
Catholic	.003		.011		.006		.034	
	(.003)		(.014)		(.013)		(.064)	
Non-Catholic	.000		.000		.000		.000	
Family Structure When Respondent Aged 10-15								
Mother and Father	-.033	-.033	-.045	-.050	-.024	.020	-.039	-.040
	(.007)	(.007	(.038	(.037)	(.011)	(.011)	(.051)	(.050)
Mother only	-.024	-.024	.025	.020	-.016	-.020	.006	.006
	(.008)	(.008)	(.042)	(.042)	(.012)	(.011	(.055)	(.053)
Other	.000	.000	.000	.000	.000	.000	.000	.000
Education of Mother or Female Raiser								
Fewer than 9 years	-.001		.089		.001		.091	
	(.011)		(.028)		(.017)		(.074)	
9-11 years	.002		.123		-.009		.089	
	(.011)		(.026)		(.017)		(.071)	
High School	.003		.101		-.016		.034	
	(.011)		(.022)		(.017)		(.073)	
Some college	-.001		.121		-.024		.046	
	(.011)		(.024)		(.021)		(.092)	
College	-.003		.113		-.030		.258	
	(.012)		(.024)		(.024)		(.108)	
No female raiser & don't know	.000		.000		.000		.000	

Appendix Table 5 cont.

Education of Father or Male Raiser								
Fewer than 9 years	.002	.003	.070	.075	.008	.006	.034	.110
	(.007)	(.007)	(.033)	(.038)	(.011)	(.012)	(.053)	(.054)
9-11 years	.001	.003	.065	.076	-.008	-.013	.037	.097
	(.007)	(.007)	(.035)	(.039)	(.012)	(.012)	(.056)	(.057)
High School	-.008	-.007	.054	.058	-.010	-.022	-.011	.040
	(.007)	(.007)	(.032)	(.038)	(.011)	(.012)	(.054)	(.055)
Some College	-.011	-.011	.049	.054	-.015	-.030	-.047	-.008
	(.007)	(.008)	(.036)	(.041)	(.017)	(.018)	(.076)	(.074)
College	-.002	-.003	.058	.060	-.047	-.067	-.190	-.062
	(.007)	(.007)	(.034)	(.039)	(.020)	(.019)	(.093)	(.085)
No male raiser	.000	-.002	.000	.023	.000	-.011	.000	.163
		(.014)		(.060)		(.016)		(.074)
& don't know		.000		.000		.000		.000
Importance of Religion to Respondent (continuous variable)								
	.005		.026		-.002		.026	
	(.001)		(.008)		(.005)		(.025)	
AFDC Benefits Relative to Median Income in Respondent's State								
≤.23	.005		-.028		.017		.067	
	(.005)		(.021)		(.019)		(.095)	
.24 -.30	-.003		-.036		.024		.077	
	(.004)		(.021)		(.023)		(.121)	
≥.31	.000		.000		.000		.000	
AFDC Acceptance Rate								
≤.50	.002		.080		.027		-.026	
	(.004)		(.020)		(.012)		(.056)	
.51 -.74	-.004		.054		.024		+.078	
	(.004)		(.018)		(.010)		(.047)	
≥.75	.000		.000		.000		.000	
Abortion Availability in State of Residence								
Liberal	.004		-.008		.002		+.127	
	(.007)		(.039)		(.016)		(.089)	
Intermediate	.000		+.002		.008		+.149	
	(.005)		(.023)		(.013)		(.067)	
Conservative	.000		.000		.000		.000	

Appendix Table 5 cont.

Family Planning Needs								
High Unmet Need	-.002		-.012		-.022		.012	
	(.006)		(.028)		(.013)		(.059)	
Medium	.003		-.022		-.011		.059	
	(.006)		(.028)		(.012)		(.060)	
Low Unmet Need	.000		.000		.000		.000	
R^2	.02	.02	.05	.04	.06	.05	.07	.05
Corrected R^2	.02	.02	.04	.03	.05	.05	.03	.03
F	6.56	0.75	4.19	5.38	7.58	11.22	.182	2.31

APPENDIX TABLE 6: Transition to Pregnancy -- Regression Coefficients, by Age & Race (Analysis of Micro Data File: Females 15-19 in 1971)

	Whites				Blacks			
	Age-Years 12-16		17-19		Age-Years 12-16		17-19	
	Rgr. 1	Rgr. 2	Rgr. 1	Rgr. 2	Rgr. 1	Rgr. 2	Rgr. 1	Rgr. 2
Age-Year								
12 & 13	.000	.000	-	-	.000		-	-
						(.067)		
14	.073	.072	-	-	.024		-	-
	(.039)*	(.039)			(.041)	(.062)		
15	.116	.116	-	-	.108		-	-
	(.035)	(.035)			(.037)	(.060)		
16	.097	.094	-	-	.112		-	-
	(.035)	(.034)			(.038)	(.060)		
17	-	-	.080	.094	-	-	.009	.047
			(.035)	(.035)			(.063)	(.062)
18	-	-	.076	.083	-	-	.068	.087
			(.032)	(.032)			(.058)	(.058)
19	-	-	.000	.000	-	-	.000	.000
Cohort								
1955	-.033	-.039	-	-	-.134	-.137	-	-
	(.037)	(.037)			(.042)	(.041)		
1954	-.076	-.077	-	-	-.055	-.064	-	-
	(.031)	(.031)			(.037	(.036)		
1953	-.026	-.031	.000	.000	-.076	-.093	.000	.000
	(.032)	(.031)			(.038)	(.037)		
1952	-.040	-.044	.033	.025	-.077	-.089	-.028	-.025
	(.031)	(.031)	(.037)	(.037)	(.040)	(.039)	(.052)	(.052)
1951	.000	.000	.037	.037	.000	.000	-.080	-.067
			(.039)	(.038)			(.054)	(.054)
Residence								
Central City	.011		-.043		.025		.080	
	(.047)		(.048)		(.079)		(.041)	
Suburbs of SMSA	-.011		-.043		.002		.000	
	(.047)		(.049)		(.087)			
Non-SMSA/non-farm	.027		.015		.036		.000	
	(.046)		(.048)		(.077)			
Farm	.000		.000		.000		.000	
Whether Catholic								
Catholic	.016	.017	-.014	-.014	.094	.080	.118	.141
	(.023)	(.022)	(.024)	(.024)	(.046)	(.045)	(.076)	(.075)
Non-Catholic	.000	.000	.000	.000	.000	.000	.000	.000
Family Composition (At ages 10-15)								
Mother and Father	-.004	-.007	-.017	-.020	-.018	-.028	-.117	-.138
	(.035	(.034)	(.050)	(.050)	(.035)	(.034)	(.057)	(.056)
Mother only	.016	.017	.008	.019	.044	.035	-.129	-.123
	(.040)	(.039)	(.056)	(.056)	(.035)	(.034)	(.059)	(.059)
Other	.000	.000	.000	.000	.000	.000	.000	.000

Appendix Table 6 cont.

Education of Mother or Female Raiser								
< 12 years	.032	.014	.000	.000	-.064	-.036	.087	.048
	(.067)	(.064)			(.048)	(.045)	(.092)	(.086)
High school	.005	-.012	-.058	-.063	.097	-.090	-.016	-.058
	(.067)	(.064)	(.027)	(.025)	(,054)	(.049)	(.098)	(.090)
Some college)	-.008	-.009	-.080	-.099	-.164	-.150	-.048	-.079
College)	(.070)	(.067)	(.033)	(.028)	(.069)	(.064)	(.108)	(.099)
No female raiser & don't know or won't tell	.000	.000	+	+	.000	.000	.000	.000
Education of Father or Male Raiser								
<12 years	-.082		-.084		.061		.004	
	(.047)		(.057)		(.037)		(.064)	
High School	-.091		-.049		.042		-.004	
	(.048)		(.058)		(.043)		(.071)	
College	-.044		-.095		-.013		-.014	
	(.051)		(.060)		(.063)		(.087)	
No male raiser	-.136		.000		.075		.089	
	(.082)				(.049)		(.081)	
Don't know	.000		.000		.000		.000	
Importance of Religion to Respondent (continuous variable)	-.01[illegible]	-.007	-.028		-.002	-.005	.040	.040
	(.011)	(.011)	(.012)	(.012)	(.016)	(.016)	(.026)	(.025)
Contraceptive Risk								
Duration **User**								
Low Yes	.069	.059	-.060	-.041	-.058	-.044	-.217	-.264
	(.051)	(.050)	(.064)	(.064)	(.057)	(.056)	(.091)	(.089)
Low No	.020	.013	-.045	-.015	-.024	-.005	-.280	-.296
	(.058)	(.057)	(.077)	(.077)	(.066)	(.065)	(.115)	(.115)
Medium Yes	.122	.113	.019	.042	.120	.136	-.013	-.138
	(.053)	(.053)	(.065)	(.065)	(.059)	(.058)	(.087)	(.086)
Medium No	.130	.125	.128	.154	.150	.164	-.028	-.042
	(.068)	(.067)	(.084)	(.084)	(.072)	(.072)	(.111)	(.111)
High Yes	.073	.059	.016	.047	.077	.082	-.042	-.060
	(.055)	(.054)	(.066)	(.066)	(.062)	(.061)	(.087)	(.086)
High No	.000	.000	.000	.000	.000	.000	.000	.000
AFDC Benefits Relative to Median Income in Respondent's State								
≤.23	-.016		-.035		.084		.045	
	(.031)		(.033)		(.041)		(.058)	
.24 - .30	-.018		.026		.052		.092	
	(.030)		(.033)		(.045)		(.070)	
>.30	.000		.000		.000		.000	

AFDC Acceptance Rate								
≤.50	.056		-.056		-.041		.050	
	(.029)		(.036)		(.035)		(.054)	
.51 -.74	-.005		-.005		.033		.015	
	(.028)		(.030)		(.036)		(.058)	
≥.75	.000		.000		.000		.000	
Abortion Availability in State of Residence								
Liberal	.024		.003		-.033		.060	
	(.032)		(.035)		(.053)		(.084)	
Intermediate	-.021		-.026		.011		.100	
	(.031)		(.032)		(.032)		(.051)	
Conservative	.000		.000		.000		.000	
Family Planning Needs								
High Unmet Need	-.014	-.016	.006	.023	.050	-.034	.059	.095
	(.040)	(.032)	(.037)	(.031)	(.041)	(.034)	(.058)	(.051)
Medium	-.013	-.023	.027	.052	.052	.011	.097	.089
	(.036)	(.027)	(.036)	(.028)	(.037)	(.028)	(.057)	(.043)
Low Unmet Need	.000	.000	.000	.000	.000	.000	.000	.000
R^2	.05	.04	.09	.07	.11	.10	.11	.09
Corrected R^2	.01	.01	.06	.05	.08	.08	.07	.06
F	1.39	1.64	3.04	3.64	3.88	5.21	2.70	3.28

+ Sample size too small to calculate probabilities.

* Standard errors are in parentheses.

APPENDIX TABLE 7 : Pregnancy Outcome -- Regression Coefficients (Analysis of Micro Data File: Females 15-19 in 1971)

	Abortion		Marriage		Out-of-Wedlock Birth	
	Rgr. 1	Rgr. 2	Rgr. 1	Rgr. 2	Rgr. 1	Rgr. 2
Age - Year						
12-14	.000	.000	.000	.000	.000	.000
15	.001	-.011	-.034	.027	-.012	-.011
	(.072)	(.071)	(.094)	(.093)	(.094)	(.093)
16	-.093	-.011	-.088	.034	-.191	-.189
	(.076)	(.070)	(.099)	(.092)	(.099)	(.092)
17	-.072	-.010	-.134	-.028	.194	.226
	(.076)	(.071)	(.099)	(.093)	(.099)	(.093)
18	.007	-.015	-.068	.024	.058	.072
	(.076)	(.075)	(.103)	(.099)	(.103)	(.098)
19	.245	.233	-.136	-.059	-.088	-.087
	(.095)	(.092)	(.124)	(.121)	(.123)	(.121)
Race						
White	.119	.128	.422	.411	-.529	-.516
	(.041)	(.034)	(.053)	(.045)	(.053)	(.045)
Black	.000	.000	.000	.000	.000	.000
Period						
1970-71	.024	.107	.024	-.023	-.001	-.058
	(.073)	(.039)	(.096)	(.051)	(.095)	(.051)
1969	-.111	.000	.281	.000	.094	.000
	(.076)		(.099)		(.099)	
1968	-.048		.389		-.057	
	(.085)		(.111)		(.111)	
Before 1968	.000		.000		.000	
Residence						
Central City	-.040		.067		.103	
	(.077)		(.101)		(.101)	
Suburb	.047		.076		.034	
	(.085)		(.111)		(.111)	
Non-SMSA/Non-farm	-.040		.003		.189	
	(.077)		(.101)		(.100)	
Farm	.000		.000		.000	
Family Structure When Respondent Aged 10-15						
Mother and Father	-.007		.010		-.043	
	(.054)		(.071)		(.070)	
Mother only	-.016		.007		.005	
	(.056)		(.073)		(.073)	
Other	.000		.000		.000	

Appendix Table 7 cont.

Education of Father or Male Raiser						
< High School	.029		.004		-.002	
	(.047)		(.062)		(.061)	
High School	.051		.002		.013	
	(.055)		(.071)		(.071)	
College Education	.269	.226	-.090	-.089	-.154	-.143
	(.068)	(.054)	(.088)	(.071)	(.088)	(.071)
Other	.000	.000	.000	.000	.000	.000
Whether Catholic						
Catholic	.018		-.034		.065	
	(.090)		(.117)		(.117)	
Non-Catholic	.000		.000		.000	
Whether Catholic & White						
Catholic & White	-.021		-.030		-.030	
	(.101)		(.131)		(.131)	
Not Catholic & White	.000		.000		.000	
Importance of Religion to Respondent (continuous variable)						
	.063		-.033		-.033	
	(.020)	(.020)	(.026)	(.026)	(.026)	
Desired Child						
Desired	-.164	-.156	.292	.281	-.093	-.098
	(.035)	(.034)	(.046)	(.045)	(.046)	(.045)
Not Desired	.000	.000	.000	.000	.000	.000
Unemployed Father Program						
Exists in home state	.106	.116	.030	.016	-.093	-.113
	(.044)	(.040)	(.057)	(.053)	(.057)	(.053)
Does not exist in home state	.000	.000	.000	.000	.000	.000
Abortion Availability in State of Residence						
Liberal	.112	.175	-.080	-.059	.002	-.092
	(.053)	(.044)	(.069)	(.058)	(.069)	(.058)
Intermediate	.164	.158	-.062	-.042	-.123	-.113
	(.043)	(.040)	(.056)	(.053)	(.056)	(.053)
Conservative	.000	.000	.000	.000	.000	.000
AFDC Benefits Relative to Median Income in Respondent's State						
≤.23 (Low)	.088	-.009	-.067	-.065	-.068	-.009
	(.046)	(.040)	(.060)	(.053)	(.060)	(.053)
.24 - .30 (Medium)	.137	-.057	-.109	-.094	-.108	-.057
	(.048)	(.043)	(.062)	(.057)	(.062)	(.057)
≥.31 (High)	.000	.000	.000	.000	.000	.000

AFDC Acceptance Rate							
≤.50	(Low)	-.081		.030		.140	
		(.052)		(.068)		(.068)	
.51 - .74	(Medium)	-.023		.059		.014	
		(.045)		(.059)		(.059)	
≥.75	(High)	.000		.000		.000	
R^2		.290	.273	.298	.270	.376	.349
Corrected R^2		.241	.247	.249	.244	.333	.325

APPENDIX TABLE 8: Predicted Sexual, First Marital, First Pregnancy Outcome Histories of 10,000 Adolescent Females in the United States, by Age in Exactly Completed Years

Black Sex Probabilities; White Pregnancy, Marriage, and Outcome Probabilities

FIRST MARRIAGE/FIRST PREGNANCY OUTCOME STATUS	AGE IN COMPLETED YEARS (EXACT)							
	13	14	15	16	17	18	19	20
SINGLE VIRGIN								
(-) to marriage not p.	10	49	112	275	454	544	483	283
(-) to single non-virgin	250	339	647	1231	1692	1557	946	509
(=) remaining	9740	9352	8593	7087	4942	2841	1413	622
SINGLE NON-VIRGIN								
(+) from single virgin	250	339	647	1231	1692	1557	946	509
(-) to marriage, not p.	0	3	15	76	238	520	831	787
(-) to single pregnant	0	0	83	257	314	265	633	460
(=) remaining	250	586	1135	2034	3173	3945	3426	2688
cumulative ever s non-v	250	589	1236	2467	4158	5715	6661	7170
FIRST MARRIAGE, NOT PREG.								
(+) from single virgin	10	49	112	275	454	544	483	283
(+) from single non-v	0	3	15	76	238	520	831	787
(=) cumulative total	10	62	189	540	1232	2296	3610	4679
SINGLE PREGNANT								
(+) from single non-v	0	0	83	257	314	265	633	460
(=) ever single pregnant	0	0	83	339	653	918	1552	2011
S. PREGNANT,MARRIAGE,OUT.								
(+) from single pregnant	0	0	40	130	161	115	319	194
(=) cumulative ever	0	0	40	170	331	446	765	959
S. PREGNANT, ABORTION								
(+) from single pregnant	0	0	18	53	34	54	129	208
(=) cumulative ever	0	0	18	71	105	159	288	496
S. PREGNANT, MISCARRIAGE								
(+) from single pregnant	0	0	12	37	12	0	42	28
(=) cumulative ever	0	0	12	49	61	61	103	131
S. PREGNANT, O-W BIRTH								
(+) from single pregnant	0	0	13	36	107	97	142	30
(=) cumulative ever	0	0	13	49	156	253	395	426

SOURCE: Table 44 for pregnancy, pregnancy outcome, and marriage probabilities
Table 45 for sex probabilities

APPENDIX TABLE 9 : Predicted Sexual, First Marital, First Pregnancy Outcome Histories of 10,000 Adolescent Females in the United States, by Age in Exactly Completed Years

- White Female Sex, Pregnancy, and Marriage Transition Probabilities; Black Female Pregnancy Outcome Probabilities

FIRST MARRIAGE/FIRST PREGNANCY OUTCOME STATUS	AGE IN COMPLETED YEARS (EXACT)							
	13	14	15	16	17	18	19	20
SINGLE VIRGIN								
(-) to marriage not p.	10	50	117	302	560	826	988	780
(-) to single non-virgin	80	108	202	374	688	869	926	780
(=) remaining	9910	9752	9433	8756	7508	5813	3899	2339
SINGLE NON-VIRGIN								
(+) from single virgin	80	108	202	374	688	869	926	780
(-) to marriage, not p.	0	1	5	24	84	219	440	518
(-) to single pregnant	0	0	26	79	111	112	335	303
(=) remaining	80	187	359	630	1123	1661	1813	1771
cumulative ever s non-v	80	188	391	765	1454	2322	3249	4028
FIRST MARRIAGE, NOT PREG.								
(+) from single virgin	10	50	117	302	560	826	988	780
(+) from single non-v	0	1	5	24	84	219	440	518
( ) cumulative total	10	61	182	508	1152	2197	3625	4924
SINGLE PREGNANT								
(+) from single non-v	0	0	26	79	111	112	335	303
(=) ever single pregnant	0	0	26	106	217	328	663	966
S. PREGNANT, MARRIAGE, OUT.								
(+) from single pregnant	0	0	2	8	11	4	31	3
(=) cumulative ever	0	0	2	9	21	25	57	60
S. PREGNANT, ABORTION								
(+) from single pregnant	0	0	2	6	0	9	25	98
(=) cumulative ever	0	0	2	9	9	18	43	141
S. PREGNANT, MISCARRIAGE								
(+) from single pregnant	0	0	4	13	4	0	30	25
(=) cumulative ever	0	0	4	18	22	22	52	78
S. PREGNANT, O-W BIRTH								
(+) from single pregnant	0	0	18	52	95	98	248	176
(=) cumulative ever	0	0	18	70	165	263	512	688

NOTE: Table 45 for pregnancy outcome transition probabilities
Table 44 for all other transition probabilities

APPENDIX TABLE 10: Predicted Sexual, First Marital, First Pregnancy Outcome Histories of 10,000 Adolescent Females in the United States, by Age in Exactly Completed Years

— White Female Sex, Marriage, and Pregnancy Outcome Probabilities; Black Female Pregnancy Probabilities

FIRST MARRIAGE/FIRST PREGNANCY OUTCOME STATUS	AGE IN COMPLETED YEARS (EXACT)							
	13	14	15	16	17	18	19	20
SINGLE VIRGIN								
(-) to marriage not p.	10	50	117	302	560	826	988	780
(-) to single non-virgin	80	108	202	374	688	869	926	781
(=) remaining	9910	9752	9433	8756	7508	5813	3899	2339
SINGLE NON-VIRGIN								
(+) from single virgin	80	108	202	374	688	869	926	780
(-) to marriage, not p.	--	1	4	22	79	198	368	420
(-) to single pregnant	6	14	40	131	227	362	478	301
(=) remaining	74	168	326	547	930	1239	1319	1378
cumulative ever s non-v	80	188	391	765	1454	2322	3249	4028
FIRST MARRIAGE, NOT PREG.								
(+) from single virgin	10	50	117	302	560	826	988	780
(+) from single non-v	--	1	4	22	79	198	368	420
( ) cumulative total	10	61	182	506	1146	2169	3526	4725
SINGLE PREGNANT								
(+) from single non-v	6	14	40	131	227	362	478	301
(=) ever single pregnant	6	20	60	190	417	779	1257	1557
S. PREGNANT, MARRIAGE, OUT:								
(+) from single pregnant	3	7	19	66	116	157	241	127
(=) cumulative ever	3	10	29	95	211	368	609	736
S. PREGNANT, ABORTION								
(+) from single pregnant	1	3	9	27	24	73	98	136
(=) cumulative ever	1	4	13	40	65	138	235	371
S. PREGNANT, MISCARRIAGE								
(+) from single pregnant	1	2	6	19	8	0	32	18
(=) cumulative ever	1	3	9	28	36	36	68	86
S. PREGNANT, O-W BIRTH								
(+) from single pregnant	1	2	6	19	78	132	108	20
(=) cumulative ever	1	3	9	28	105	237	344	364

NOTE: Table 44 for sex, marriage and pregnancy outcome probabilities
Table 45 for pregnancy probabilities

APPENDIX TABLE 11: Predicted Sexual, First Marital, First Pregnancy Outcome Histories of 10,000 Adolescent Females in the United States, by Age in Exactly Completed Years

Black Sex, Marriage, Pregnancy, White Pregnancy Outcomes

FIRST MARRIAGE/FIRST PREGNANCY OUTCOME STATUS	AGE IN COMPLETED YEARS (EXACT)							
	13	14	15	16	17	18	19	20
SINGLE VIRGIN								
(-) to marriage not p.	10	97	186	339	506	503	360	216
(-) to single non-virgin	250	338	638	1205	1640	1520	966	552
(=) remaining	9740	9305	8481	6937	4791	2768	1442	674
SINGLE NON-VIRGIN								
(+) from single virgin	250	338	638	1205	1640	1520	966	552
(-) to marriage, not p.	—	6	23	89	245	422	488	442
(-) to single pregnant	19	43	124	411	610	813	868	449
(=) remaining	231	520	1011	1716	2501	2786	2396	2057
cumulative ever s non-v	250	588	1226	2431	4071	5591	6557	7109
FIRST MARRIAGE, NOT PREG.								
(+) from single virgin	10	97	186	339	506	503	360	216
(+) from single non-v	0	6	23	89	245	422	488	442
(=) cumulative total	10	113	322	750	1501	2426	3274	3932
SINGLE PREGNANT								
(+) from single non-v	19	43	124	411	610	813	868	449
(=) ever single pregnant	19	62	186	597	1207	2020	2888	3337
S. PREGNANT,MARRIAGE,OUT.								
(+) from single pregnant	9	21	60	208	314	353	347	189
(=) cumulative ever	9	30	90	298	612	965	1402	1591
S. PREGNANT, ABORTION								
(+) from single pregnant	4	9	27	85	65	164	177	203
(=) cumulative ever	4	13	40	125	190	354	531	734
S. PREGNANT, MISCARRIAGE								
(+) from single pregnant	3	6	18	59	23	0	58	27
(=) cumulative ever	3	9	27	86	109	109	167	194
S. PREGNANT, O-W BIRTH								
(+) from single pregnant	3	7	19	59	208	296	196	30
(=) cumulative ever	3	10	29	88	296	592	788	818

SOURCE: Table 44 for pregnancy outcome probabilities
Table 45 for sex, pregnancy and marriage probabilities